

If the INDUSTRIAL REVOLUTION had a capital, it was Coalbrookdale. Karen Gold visits the area and describes the most recent attempts to preserve a crucial moment in modern British history (page 10)



After International Women's Year in 1984 the International Year of YOUTH in 1985. The Americans haven't heard about it; the British Government's generosity does not stretch beyond fitting out a basement office; but the Turks are taking it very seriously indeed (page 11)

Plants need no passports: V. H. Heywood looks at international cooperation in the field of BOTANY and at the significance of the massive *Flora Europaea* (page 13)

The true or the useful? John Passmore reviews two new studies - by Peter Medawar and by Nicholas Rescher - on the LIMITS OF SCIENCE (page 16)

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Carrots and sticks

The formal appraisal of teachers in higher education, whether with the positive intention of helping their professional self-development or the negative intention of introducing some crude "payment by results" scheme (or, more likely in higher education, low pay for sociologists and high pay for computer scientists), cannot yet be described as an idea whose time has come. But neither is it likely to go quietly away.

At present the Secretary of State's enthusiasm has been focused on the unfortunate school teachers who are to be bullied into becoming better teachers. But Sir Keith Joseph's determination to inject performance indicators and incentives into the salary structures for primary and secondary teachers is unlikely to be deflected by any *cordon sanitaire* around higher education. Polytechnic and college teachers in any case are already embroiled in the Department of Education and Science's embryonic plans for teacher appraisal because their salaries are negotiated through the same Burnham machine. Only university teachers for the moment remain apparently inviolate. But even in this inner citadel of professional autonomy the Jarratt committee has recommended there should be annual reviews of all university teachers as part of a regular staff appraisal system.

The reaction of many, maybe most, people in higher education will be to reject the idea of regular staff appraisal out-of-hand. They are likely to regard such a proposal as a punitive instrument that could be used to coerce the awkward lecturer with inconvenient opinions far more easily than to weed out the truly incompetent or irredeemably idle. According to this view any system of staff appraisal, however skilfully designed to improve teaching, is an invidious and irresponsible power which the managements of higher education, at national, sector, and institutional levels, could use for whatever purposes they wished.

Others may react less ferociously.

Some may even accept the case for teacher appraisal - for school teachers - but argue that higher education is a special arena in which such a technique would be inappropriate. The only body truly capable of appraising the scholarly quality or scientific productivity of a university or polytechnic teacher is the "invisible college" of his/her disciplinary peers.

This is a strong argument. If supervisors sometimes find it difficult to accumulate the intellectual authority to judge their research students, how much more difficult will it be for the managers of institutions, who except by occasional accident will be strangers to the discipline followed by those they are supposed to appraise, to accumulate the minimum legitimacy to make any appraisal scheme credible. Of course, it could all be left to codicilarians but the most likely outcome would either be to encourage the petty tyranny exercised by too many heads of departments already or to reinforce a cosy and mutually protective collegiality.

The other set of careful and discreet critics of teacher appraisal may prefer to adopt the "Up to a point, Lord Copper" defence rather than risk provoking superior power by direct opposition. They will argue that some fairly weak form of staff appraisal is acceptable, but only if it is employed supportively to encourage professional self-development. They will reject any attempt to link performance as revealed by such appraisal with pay.

Yet there is also likely to be a strong minority within higher education that is tempted by the idea of staff appraisal. Many younger teachers are frustrated by the lack of opportunity for promotion, or simple mobility. Their prime attraction is the intellectual excitement of their own research. Colleagues recruited when competition for academic posts was much less fierce and who have given up their scholarly hopes long ago and may not even be very effective teachers any more. If some form of appraisal could help to

ease this academic sclerosis which has begun to infect large parts of higher education since the end of expansion, some may be tempted to offer such ideas conditional support.

There will be others who feel less justifiable frustration because they follow a "relevant" discipline like computer science or accountancy and so possess skills that command high salaries outside higher education yet are paid no more than those unemployable humanists and social scientists. The objections to this view, apart from its disgraceful lack of moral solidarity with fellow scholars and scientists, is that "relevance" is a volatile quality blown this way and that by the short-term lurches of the job market and the shorter-term puffs of political fashion. In any case, the accountants and the IT people already have their reward; theirs are among the very few areas in higher education where job and promotion prospects are opening up rather than being closed down.

So staff appraisal is a complex issue worth much more than a perfunctory knee-jerk opposition. For the next 10 or maybe 15 years British higher education must endure "steady state" a condition it has not experienced within the professional memory of anyone at present working in universities, polytechnics and colleges. Among the many disturbing phenomena of "steady state" is likely to be a growing dislocation between achievement and reward, between performance and incentive. The great Robbins expansion provided such a wide selection of incentives and rewards that, although the undeserving may also have benefited, the deserving were more than satisfied. Nothing so easy will happen in the next 10 years. Higher education faces a real difficulty and staff appraisal, in its mild non-punitive Jarratt form, may provide a small part of the answer. For better or for higher education itself to address this issue today than have some ill-fitting off-the-school-peg solution thrust upon it tomorrow.

Partnership not tutelage

Inevitably the bulk of the Lindop report on external validation in the non-university sector will concern the future of the Council for National Awards, and in particular its future relationship (if any) with the most developed polytechnics. But another by no means unimportant issue which the report will also address is the future of university validation of degree courses in some colleges of higher education.

This is not a negligible activity. Fourteen universities - Bath, Surrey, Leeds, Lancaster, Nottingham, Kent, Exeter, Cambridge, Southampton, Liverpool, Leicester, Manchester, Birmingham and Wales - are involved in external validation. Their degree of involvement of course, varies in scale and the justification for their involvement also varies widely. In some cases the number of relevant students is negligible; in others today's involvement reflects yesterday's commitment in the days of the area training organizations headed by university institutions of education; in others again - Lancaster is a good example - an

attempt has been made to build up a genuine academic partnership between university and colleges; but in a few cases university validation looks suspiciously like a marriage of convenience to avoid a much more demanding co-operation with the CNA.

The case for continued university validation of college degrees generally rests on historical sentiment and greater flexibility built on more intimate and informal knowledge than can be possessed in a bureaucracy like the CNA. The argument is that colleges find it easier to adapt their courses because the approval procedures to be followed within their patron-universities are comparatively simple, while the universities are able to keep a closer watch on college standards because everyone knows everyone else. The case against university validation is that it entrenches a tutelage relationship which makes it difficult for colleges to develop their own academic independence, and that inherent in the relationship is a structural assumption that college students are to be satisfied with second best, while the

CNA for all its rigidity has always been determined to offer its registered students first best.

The first objection is difficult to prove and the second is indignantly denied. Yet this widespread use of the mouthed description "BA Collegiate" to distinguish external college from internal university degrees is not encouraging. Nor, to take a specific example, is it clear what guidance a predominantly technological university like Surrey has to offer a predominantly arts college like the Roehampton Institute of Higher Education.

At the best the case for continuing university validation remains non-proven. To many people (like the National Advisory Body) it looks like an anachronism. A few universities may wish to retain close links with neighbouring colleges; but there must be a rapid evolution in their relationship away from tutelage and towards partnership. It is also important that only those universities with a full-hearted commitment to developing such links continue in the validation business.

Lacking youthful enthusiasm

It is hardly surprising that the Government is not exactly fired with enthusiasm about the International Year of Youth for all the official statements of support. Expensive, loosely-focused, international initiatives are not of its own making; are not the Government's style. No doubt every minister could find a use for the meagre grant awarded to IYY which would find more favour with the Cabinet.

However, that does not make the level of official support for the year any more acceptable. There is no record of British opposition to the initiative in the United Nations; whatever doubts may have existed about the usefulness

Presumably, too much political capital could have been made from a stance which might have been construed as anti-youth.

Yet to give such token support is almost equally insulting to young people. The grant given to IYY has proved quite inadequate to enable the organization to sustain the national effort needed for the year to achieve anything worthwhile. The more honest approach would have been to say from the outset that the practice of dedicating every year to a different group had run its course and should be discontinued.

Instead, IYY is left to limp along, leaving many of those involved with its activities more disillusioned than they were already. There is perhaps more to be said of truth in Labour's allegations that the heavy emphasis on unemployment, are an embarrassment to the Government. But, like the problems themselves, ignoring them will not make them go away. The style of IYY may not be to ministers' liking, but it has not been extravagant financially. It would cost very little to ball out the organization sufficiently to allow its programme to be completed.



I found myself searching in my mind a few weeks ago during a meeting for a euphemism that would indicate that the point we had just heard would be worthwhile if it hadn't been made by such a bloody fool. I found none. Words about the speaker's characteristic perceptiveness but they deceived nobody. So I have had recourse to Philip Howard's mastery and entertaining book *The State of the Language*, which I have been dipping into with great joy in the last few months.

He writes unaffectedly about language, which must be difficult to do. The book has an informality that I respect. Readers of this column may notice that informality is something I have been trying to cultivate. I would do the same for my behaviour if it was necessary. But informality is something I can't avoid. I was told off by a student one day for it. "How could I know you're the director if you go around dressed like that," he demanded angrily.

Howard's book is also containing. He accepts that split infinitives are not as evil as they used to be. And he produces some classic examples of double entendres, like the wartime headlines "All Push Bottles Up Germans", "Her is another: 'Man eating piranha mistakenly shot as fish'". I can't even think of that without shaking with laughter.

But that matter on which I needed his help was *Euphemism* and he devotes a chapter to it. Related to euphemisms, he says, are those lying phrases that mean the opposite of what they say. Arnold Lunn invented a word, for them - phrops - of which the phrase *Industrial action* is an example.

The phrops I am most familiar with include "the cheque is in the post" and one I have often heard on the telephone from an official in the local authority, "Do you know, your letter is right at the top of my tray and I was in the very midst of answering it when your rang". The academic world is full of them. "It has long been known that..." ("I haven't bothered to look up the reference"); "It is clear that much additional work will be required before a complete understanding..." ("I don't understand it").

The most cowardly start of a closing sentence in a massive thesis I ever read went something like this: "Perhaps in conclusion it would not be altogether too rash tentatively to suggest that in certain circumstances it might be the case that..."

I must cultivate some new euphemisms. Here are some from an American phrase book for business men: under consideration (never heard of it), under active consideration (we're looking in the files for it), reliable source (the guy you just met), informed source (the guy who told the guy you just met), undependable source (the guy who started the rumour in the first place).

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Lindop proposes degree of power

by Karen Gold

Freedom from external validation and power to award degrees is held out to polytechnics and colleges in the report of the Lindop committee on public sector validation published this week.

The report was welcomed in the House of Commons by Secretary of State for Education and Science Sir Keith Joseph. "The Government attaches great importance to the maintenance and improvement of academic standards throughout the education system and will study the committee's report with interest," he said. He would be consulting interested parties, and asked for comments by June 7.

The report recommends legislation enabling the Secretary of State to designate certain institutions as holders of complete autonomy, and vesting them with the power to award degrees. It stresses that the Secretary of State could also withdraw designation.

The committee chairman Sir Norman Lindop said at a news conference that designation was likely to apply to some but not most of the polytechnics. The report envisages three categories of institution: those awarded without external validation of courses, those validated by groups of courses and those validated course by course. Even the last group would experience more relaxed validation than the present Council for National Academic Awards manages, he said.

The Lindop committee was set up by Sir Keith a year ago to look at degree validation by the CNA and validating universities, after allegations that the

CNA had failed to spot bias in sociology courses at the Polytechnic of North London. Its members are Dame Mary Warnock, Professor Elie Kedourie, Professor Geoffrey Elton, Dr Joseph Dunning, Sir Alec Morrison, and Mr Leighton Davies.

The report lays down three principles, of which the first and most frequently emphasised throughout is that academic standards are ultimately guaranteed within institutions not outside them, and that therefore institutions should take as much responsibility for their own validation as they are able and willing to do.

"It is not until institutions are given responsibility that it will be possible to tell whether they are fit to have it," the report says. Existing controls are so elaborate they may hinder high standards. "We believe that external validation is in some cases entirely and in many cases partly redundant. Time and again during our inquiry we were assured that many if not all institutions in the public sector have developed and are now 'mature'. Let them prove it."

The other two principles the committee lays down are that institutions should be treated differently for validation, and that mode of validation should not be an indication of status. As well as legislation, its accreditation proposals will require an amendment to the CNA royal charter.

The report criticizes both the CNA and university validators. Some universities may not be insisting on adequate standards and others applying a double standard between college students and their own, the report says. It recommends a central body to

coordinate university validation, regional consortia of university validators and a code of practice. The CNA deserves great credit for its past contribution to the development of the public sector, the report says. But it now runs "a ponderous and inflexible system in which form is disproportionate to substance." It is accused of heavyhandedness, of bureaucracy, of inconsistency in judgements and of lack of involvement in delivery of courses.

It will be involved in deciding which institutions should receive accreditation, the report says. (Lindop recommends an advisory committee to the Secretary of State to consider applications for designation and autonomy.) But its financing should be brought under ministerial control, and money redistributed to fund a developed external examiner system which the committee sees as the main safeguard of standards for freer institutions. It should completely review its activities, which would anyway be significantly reduced.

The Committee of Directors warmly welcomed the report and its recommendations for designation and the establishment of an advisory committee. "The report supports the CDP view that academic quality is ultimately determined by the scholarship, teaching and research of institutions," said CDP chairman Dr Harry Law.

But Mr Bob Morris, education secretary of the Association of Metropolitan Authorities said the report was over-ambitious and would create an elaborate hierarchy of institutions.

Details, page 4, Leader, back page

Engineering boost may exclude polys

by John O'Leary

Years are growing that the second phase of the Government's £43 million initiative to boost engineering and technology may mirror the first phase and exclude the polytechnics, or offer them only token representation.

Nominations for the second phase will be completed next month and decisions are under way between the Engineering Council and a range of professional and industrial groups. Industrial pressure from industry has been a second theme of undergraduate education, based in the universities, to provide more software engineers.

The National Advisory Body and the public sector organizations are being urged to press the case for the new education to concentrate on high-technology places. But the NAB still has not been invited to give advice on the "switch" money should be given.

At this week's meeting of the NAB representatives of the Department of Education and Science were challenged to explain why the NAB had not been asked for advice on the first phase of the initiative. But no answer was forthcoming.

The local authority associations are all intending to press Sir Keith Joseph, Secretary of State for Education and Science, to amend last month's announcement to include the polytechnics.

The speech to the Institute of Energy Engineers by Dr Kenneth Miller, director general of the Engineering Council, emphasized the plight of the polytechnics. But, he said, the council was aware that they had already received their engineering places and that they were strongly for the universities to do the same.

Dr Miller repeated his call for the universities to fund for engineering education the only way to achieve the country's aim of maintaining funding levels for the subject. He did not believe that the universities or the polytechnics were capable of guaranteeing the recommended staff/student ratio of their own accord.

He warned that earmarking would mean major changes in both sectors of education. "There will have to be a greater degree of concentration on the subject between one academic discipline and another and between engineering disciplines and other disciplines," he said.



John Charteris, one of the AUT negotiators, posts a bundle of protest letters to Sir Keith Joseph.

Settle now, argue later, say v-cs

Vice chancellors have refused to make an immediate joint approach to the Government on the damage caused by the erosion of lecturers' pay.

They have made clear to the Association of University Teachers that although they share the same view of the damage being inflicted on the university system, they are not prepared to make a joint approach through Committee B, the second stage of the negotiating machinery, until this year's pay rise is settled.

University lecturers may consider withholding examination marks as one way of stepping up the pressure. AUT president Mr Ron Emanuel said in Sheffield: "One of our products are graduates - if we withhold examination results we will be withholding this product."

The deadlock in negotiations in Committee A, came as thousands of academics this week supported a union day of action in protest at the erosion of their salaries. And college lecturers were balloting on a call for selective 24-hour strikes to coincide with rallies in major cities during May.

The university employers repeated the 4 per cent offer which the AUT has already rejected. With inflation predictions now rising this figure was dismissed by the AUT as increasingly derisory, and its negotiators pressed continued on page 3

UCCA urged to open confidential files

by Peter Aspden

Local authorities have urged the Universities Central Council on Admissions to relax its procedures on confidential references for potential students applying to universities.

At present, when a candidate applies for a university place through UCCA, a space is reserved on the application form for a confidential report from the school or college.

Now the education committee of the Association of Metropolitan Authorities has asked UCCA to make references available to candidates. This follows a similar plea by the London Education Authority, which

has already opened its records on secondary school pupils to parents.

Mr Bob Morris, the AMA's education officer, said it was unnecessary for references to universities to be kept secret. "We are making a request which is a response to the policy direction which many local authorities have already taken, in support of access to information."

He said that, in considering applications, most universities gave considerable weight to references, which made their content very important.

But a spokesman for UCCA said that references would lose much of their value if they were deprived of

their confidentiality. "There is obviously no question of UCCA or universities releasing information after the application has been received," he said.

"But our feeling is that references might lose some of their frankness, and become a little more censored if they are made open at the time of application. Selectors would certainly miss the value of a confidential reference, particularly when considering conditional offers."

But the UCCA spokesman said: "If universities came to the conclusion that all references and reports on candidates should be made open, we wouldn't seek to interfere."



Letters to the editor

Balancing the books and salaries

Sir, - I read that the University Grants Committee's verdict on the library of Imperial College (Imperial attitudes attacked by UGC, *THES* April 12) was that "expenditure on salaries seemed to be disproportionately high". I do not wish to comment on the specific criticisms levelled at Imperial College. I am more concerned at the UGC's apparent belief in the existence of a "general rule" that "expenditure on salaries and books should be roughly in balance". If such a rule exists, then relatively few libraries appear to be observing it. In 1982/83 the median percentage for staff expenditure in

British university libraries was 60 per cent. As the librarian of the University of Hull had so aptly pointed out in his recent annual report in answer to similar criticisms from the UGC Social Sciences Subcommittee: "imbalance between payroll and non-payroll library expenditure is best rectified by increased book grants. University librarians are not responsible for the very severe cuts in book funds experienced since 1981. Indeed they have campaigned vigorously against them. In 1972/73 this library employed 30 staff and spent 52 per cent of its income

on paying them. Twelve years later, with greatly increased responsibilities, we employ 36 staff and spend 61 per cent of our income on paying them. What is important about this changing pattern of expenditure is not that we have failed to achieve some arbitrary percentage limit but that we have made real and substantial improvements in efficiency. I do not concede that the "rough balance" desired by the UGC is a sensible policy objective. Even if it were, the problems of actually achieving it would be formidable. The management of university libraries is sub-

ject to precisely the same constraints as those operating in the rest of the university system. Pursuit of the UGC's "general rule" will continue to be frustrated by tenure, low job mobility, wage and salary awards, incremental drift, and in all probability falling total budgets. Over none of these things has the library manager the slightest degree of control. Willing ends without means is the least helpful service the UGC can perform. Yours faithfully, P. G. PEACOCK, University Librarian, University of Stirling.

Teacher fellowships

Sir, - As the Sheffield University division of education's admission tutor for teacher fellowships, I have read with some puzzlement your article and correspondence on these fellowships, for what I administer does not appear to fit particularly closely to what I have read. Mr Stephens (*THES*, March 22) classifies teacher fellowships as providing the opportunity to produce work in the research which is the province of a doctoral thesis - in his case, "fellowship" one might read "scholarship". The major drawback, of course, is the financing of such fellowships, in spite of Mr Stephens' comment to the contrary, where fellowships are already paid for by local authorities' contributions to the "pool".

However, leaving aside his positive proposals as to how fellowships should be changed, it is clear that the Department of Education and Science's conception of existing teacher fellowships is certainly different from that of Mr Stephens. Fellows are seconded to pursue work that they and their employing authority find appropriate, the university acting as a "facilitator". The teacher must, therefore, satisfy both his local authority and the university that his work is likely to be of use and completed within the period of the fellowship.

The work, then, might well eventually be published in book form as far as the local authority is concerned (and they are, after all, funding the fellowships), the dissemination of the fellow's work is likely to be through various in-service provisions, local authority commitment which the DES emphasizes as a requirement for fellowships being considered for funding from the "pool".

I should point out, in passing, that this university at least all teacher fellows have the same access to the library as staff and have designated members of staff who supervise their work, so two of Mr Stephens' positive proposals are of interest, but his description of our organization of the fellowship scheme, at least, is a puzzling one in that it does not appear properly to reflect the realities of the teacher/local authority/university DES relationship.

Mr Winter's letter (*THES*, March 29) also relates fellowships to "patent authors", whereas that is not the way in which we have found them operating. Moreover, such authors, with other applicants have first to "sell" their proposal to their authority and then to the university, so the idea that headmasters can use fellowships as "prizes" is, at best, an odd one. Headmasters do not award fellowships and so, even if they wanted to, they could not, for fellowships are not available to them as a "reward".

Second, Mr Winter's proposal that fellowships should run over a number of weekends would produce fellowships that would be of little use to the majority of fellows, because their work involves schools, hence the requirement for secondment during the school day.

Finally, from the point of view of the "awarding body" we rarely, if ever, take into account the application of fellowships to the needs of the school with us, with the support of the authority and their headmaster, to complete work in education that is of value to themselves, their school and to authority. If Mr Winter's proposal were implemented then it would be the interconnecting responsibilities of fellowships (between teacher, local authority, and university) that would be "bypassed", not headmaster to be an innovative and value scheme.

Yours sincerely, D. P. GILROY, Sheffield University division of education.

Teacher places still vacant

by Patricia Santinelli

A surprisingly large number of vacancies still exist on secondary postgraduate courses starting this autumn in a wide range of subjects, according to the latest figures released by the Clearing House and Graduate Teacher Training Registry.

There are no places left on general middle and primary Postgraduate Certificate of Education courses, but there are still vacancies for both primary and secondary BED courses. Ironically, North Riding College, recommended for closure by the National Advisory Body, is full for all courses.

The registry's records shows that vacancies remain in biology, business studies, chemistry, combined science, computer studies, craft design and technology, economics, English, French, German, home economics,

maths, music, physical education, physics and religious education.

The greatest number of vacancies appear to be in chemistry, maths, physics and English. In chemistry there are still places at 21 universities and 12 polytechnics and colleges.

For maths there are vacancies in 26 universities and 21 colleges and polytechnics; physics in 29 universities and 13 colleges and polytechnics; for English in nine universities and 14 polytechnics and colleges.

Hertfordshire County Council said this week that it will strongly oppose any Government attempt to close down its Aldenham-based college of higher education.

Under NAB proposals, Hertfordshire College of Higher Education would lose all intakes to initial teacher training from next year. This would effectively close down the col-

lege which since the removal of its BA courses is entirely devoted to teacher education.

The council's education personal and urgency subcommittee has now written to both the NAB and the Secretary of State for Education urging that the college should retain its teacher training intake beyond 1986.

Mr Derek Haslam, the college's director, said that it had been considerably surprised by the NAB's proposal since it met all the criteria set out by the body's teacher education group.

Dr Haslam added that it was even more surprising that the NAB had decided without replying to the council's proposals last year that the college should jointly share planning of teacher training with Hatfield Polytechnic. Instead a recent letter from the NAB deplored the lack of progress on this front.

Sackings for serious offences on increase

by David Jobbins

Universities are making more use of the "good cause" procedures under which tenured academics may be sacked for serious offences, according to the university lecturers' union.

The number of cases each year remains low, but the AUT detects a significant increase and believes that this can be attributed to the ending of the early retirement scheme under which thousands of lecturers have left the service with the costs of their compensation borne by the Government.

Officials say that current cases have risen to five or six for each of the past two years, compared with a previous figure of two or three.

But the Committee of Vice Chancellors and Principals has discounted the suggestion that universities are consciously using the procedures to cut numbers of staff further.

The procedures are extremely demanding and in the past universities have tended to use alternative ways of weeding out miscreant lecturers.

The AUT says that cases are now cropping up at universities that have

previously studiously avoided the procedure. Senior officials believe that some administrations may be attempting to preempt the Government's plans to legislate on tenure for future staff by demonstrating they already have the powers to take tough action.

The increased caseload is placing an extra burden on the AUT's legal aid service.

● The University Grants Committee has almost met its forecast of a reduction in university staff over the last three years of 11,600, made up of 6,300 by early retirement and redundancy and 5,300 through natural wastage.

Most compensation claims have been settled, according to the UGC annual survey for 1983.

The UGC paid out £36 million last year to meet redundancy claims for 1,000 academic and academic-related staff and 400 non-academic staff. A total of £120 million has now been paid out for 3,900 claims. They have also paid £2.4 million to reimburse 75 per cent of the salary costs of part-time teachers needed during the contraction. This related to 728 members of staff.

Data protection

Sir, - Just because there is so much concern about the matter I feel it is worth spelling out in detail the position under the Data Protection Act on examination marks, which was briefly alluded to by Chris Edwards and Nigel Savage (*THES*, April 5). The extension of the standard 40-day period for responding to requests for access is, in fact, to 40 days from the announcement of the results (as Edwards and Savage mentioned) or five months from the request whichever is the earlier. Furthermore if either of these extensions is used, the data duplicated has to include that which was held at the time of the request and all changes made up to the time of complying with the request.

Thus the best policy in dealing with student requests to see their examination marks may not be to deal with such requests only following publication of the final results as the simplified statement in the Edwards and Savage article might have led readers to suppose.

Yours faithfully, External Relations, The National Centre for Information Technology, Manchester.

Frye titles

Sir, - Professor Fowler (*THES*, March 22) says he often recommends Northrop Frye's work to his students. One can't help wondering, though, how much of it they have to choose from. The three large works will be widely available of course, but what about the dozen shorter books published since *The Anatomy of Criticism* which provide an introduction to his thought and relate it to wider social, moral and political questions?

A measure of the "British provinciality" Professor Fowler so detests would be the number of Frye's titles to be found in British university libraries and bookshops. From there one might go on to ask how many British students of literature have been told at any length about him by the time they graduate. The chances are that if they have, it won't have been in terms of Professor Fowler's "profound admiration".

More probably he will have been touched upon as someone solely intent on forcing everyone and everything into an "archetypal" or "scientific" critical system, who has turned away from the actual world, or even



Northrop Frye: accused by dogmatists

as someone whose unconscious aim is to repossess literature in the cause of Christianity.

In this context, Professor Fowler's use of the word "dogmatist" may be unfortunate since it will have caused many to nod their heads for the wrong reasons. For if there is one thing Frye's work as a whole is "about" it is the power of the creative

imagination to liberate us from all forms of dogma, prejudice, indoctrination and the stock response. Throughout the shorter works the hypothetical possibilities of literature are constantly brought to bear on social and political values, confronting and exposing them, not providing alternatives to them.

It is not surprising that dogmatists should accuse him of extreme aestheticism and the like. Indeed, one might ask who had the better reason to misrepresent him, the Christian or the Marxist; or for that matter what any misrepresentation of such a lucid and radical thinker, with his vision of a free and classless society, could tell us about the provincial or reactionary mentality.

It would be a pity, in short, if students without the time or stimulus to read *The Anatomy of Criticism* or *The Great Code* in their entirety could not readily hold of *The Modern Century* or *The Educated Imagination*, for example.

Yours faithfully, C. M. CHADWICK, Representative of the British Council in Canada, 80 Elgin Street, Ottawa.

Missing out

Sir, - This issue of age limit of 35 for "new blood" appointments goes somewhat beyond the sexual discrimination factor that was referred to by F. C. Keys (*THES*, March 19). Motherhood is not the only reason for a delayed entry into an academic career and those with more educationally important experience are also excluded.

One of the observations of the report of the Finniston committee on the educational needs for our manufacturing industries was the lack of substantial experience in industry of the lecturing staff of universities and polytechnics. This has partly been countered by the establishment of part-time industrial professors but will hardly meet the requirements for the

developing work in universities and polytechnics for the higher education of technician engineers.

These engineers, who are needed to support the work of the chartered engineering Council, were previously educated in further education colleges whose staff traditionally include wide industrial experience over many years. "New blood" appointments in engineering are almost exclusively "new technology" appointments and there should be more concern to maintain and develop the older technologies which will continue to contribute to the major part of our manufacturing activity.

Yours sincerely, K. A. YEOMANS, 306 Uxbridge Road, Rickmansworth, Herts.

Medical ethics

Sir, - While it was encouraging to read of the hopes and aspirations of the new Ian Ramsey Centre in Oxford (*THES*, April 5), your article was less than reassuring. It seemed to me that you were already well established in undertaking similar work to that proposed for the new centre.

The Institute of Medical Ethics has its origin in the London Medical Group, founded in 1963, of whose governing body Ian Ramsey, then Bishop of Durham, was a member until his death. The London Medical Group is an independent, non-partisan student group for the study of issues raised by the practice of medicine which concern other disciplines. In its work among medical and nursing students it has always been multi-disciplinary, involving theologians, philosophers, lawyers and lay people in its discussions.

Similar groups now exist in virtually all the teaching hospitals in this country, including Oxford. Their work has been extended to the postgraduate level by the Institute of Medical Ethics. The Institute publishes a monthly bulletin for its members and, for the last 10 years, the quarterly *Journal of Medical Ethics*. It runs

courses for health service teachers and undertakes research, producing reports on such subjects as death and dying, the ethics of resource allocation or the ethics of research on children.

In the last 15 years, three other organizations have also been working in the field of multi-disciplinary discussion of the problems raised by medical and scientific advances. The Council for Science and Society has produced a number of important reports on such subjects as risk assessment, expensive medical technologies and, most recently, human procreation. The Centre for Medical Law and Ethics at King's College London works in a similar academic setting to that available to the Ian Ramsey Centre. The Linacre Centre for the Study of Ethics of Health Care provides a specifically Roman Catholic input into discussions of medical ethics.

So, while it may be difficult to explain why it has taken until 1985 for Oxford to set up an Anglican centre, the rest of the country has been far from idle.

Yours sincerely, R. H. HINCHOLSON, Deputy director, Institute of Medical Ethics, Tavistock Square, London WC1.

Youth year

Sir, - Although John O'Leary is right to draw attention to the half-hearted Government response to International Youth Year (*THES*, April 19), he is wrong to ignore the role of the Liberal Party in trying to snatch success from Government's inspired failure.

Liberal MPs have already been given leave to introduce four Bills dealing with youth issues into Parliament. Indeed, we are in a better position than the Romanians whom Mr O'Leary praises, as we have already drafted our own Youth Charter Bill, sponsored by Jim Wallace MP. We have also established a high level committee to produce a White Paper on the Liberal Party's youth policy.

Finally, we are taking a youth day in London on May 15, featuring tours of Parliament, an Any Questions session hosted by David Steel, films, music and political seminars.

I am sure that your correspondent will be pleased to note that at least one British political party is treating IYY with the seriousness it deserves.

Yours truly, DAVID ALTON MP, Chair, Liberal Youth Campaign Group.

Letters for publication should arrive by Tuesday morning. They should be as short as possible and written on one side of the paper. The editor reserves the right to edit or amend them if necessary.

College merger slow to gel

Serious obstacles are in the way of the proposed merger between Goldsmiths' College and Queen Mary College, an important part of the shake-up of London University.

The two colleges have already missed the end-of-February deadline set by the university to reach an agreement on the feasibility and desirability of the merger. They have now been given until June to sort out their views.

But a joint committee of the two colleges has already produced a number of preconditions which have to be met before the merger plans can go ahead - and it has warned that the finalising of the merger and the new institution could be the biggest obstacle of all.

Goldsmiths' College has already written to the vice-chancellor of London, Professor Sir Randolph Quirk, the Department of Education and Science asking for clarification on the University Grants Committee's attitude to transitional earmarking of funds.

But a report presented to the college's consultative group on the merger said: "There is little likelihood of any permanently increased funds to cover the additional costs of transferring the Goldsmiths' element of the new institution to university-level funding."

And a college official said this week: "There are obvious academic advantages in the merger, which both colleges have acknowledged - but we are very worried about the financial position."

The report also identified constitutional problems arising from a merger, stating there was concern over the status of Goldsmiths' staff teaching for awards not validated by the university, as they were not eligible for recognized teacher status.

Other difficulties, such as the balance between arts and sciences in the new institution and the future of Goldsmiths' science departments, had to be seen in the light of the wider reorganization of London University and the national moves to shift numbers between disciplines, said the report.

Both colleges have accepted that neither should absorb the other in the event of a merger, but that a completely new institution should emerge. The university's joint planning committee will consider the two colleges' views at its meeting on May 2.

Vice chancellors urge union to settle now, argue later

continued from front page

A substantial interim increase of at least 7.5 per cent.

Although there were signs that the lecturers believed the negotiations were at the point of breaking down, the two sides agreed to adjourn until May 8.

The bulk of the 770 branches of the National Association of Teachers in Further and Higher Education are operating an overtime ban and other sanctions after rejecting a 4 per cent offer.

The union is planning strikes in Southampton and Manchester for

May 8; Bristol, Cardiff, Nottingham and Birmingham on May 9; Liverpool and Leeds on May 14; and Newcastle on May 15. They will coincide with 24-hour strikes in selected regions.

Scottish further education lecturers are pressing for 10 days' annual in-service training for their work on the Government's action plan.

Lecturers have already drawn up more than 1,000 modules for the new curriculum, and for staff to be given at least two hours a week in a maximum of two hours' class contact time for assessment, guidance and counselling.

section says the work has imposed "additional burdens on our members, contributing to stress, strain and other anxieties, and ultimately stretching the goodwill of our members to breaking point".

At the next meeting of the Scottish Joint Negotiating Committee, expected to take place next month, staff will ask for 48 hours of class contact time to be made free to develop each module, and for staff to be given at least two hours a week in a maximum of two hours' class contact time for assessment, guidance and counselling.

Professional Association of Teachers
99 Friar Gate, Derby DE1 1EZ
Tel: DERBY (0332) 372337

PAT provides professional and legal services for lecturers in colleges of all kinds. It is a fully certified trade union.

PAT does not belong to the TUC. It is a condition of membership that applicants undertake never to participate in strikes.

We work for a high level of professional commitment among teachers and lecturers; for the promotion of their interests by the force of argument rather than the argument of force; for the establishment of a genuinely professional image for the teaching profession.

Membership increased by over 25% in 1984. We continue to grow in all parts of the United Kingdom. In 1985, we believe that the future of the profession lies in the direction we are taking.

If you wish to consider joining us, write for more information to the following address (no stamp required):

Professional Association of Teachers, FREEPOST, Department 10, 99 Friar Gate, DERBY, DE1 1EZ.

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Attendance for formal teaching is basically Tuesday evenings for the first two years.

Admissions Enquiries (02323) Middlesex Polytechnic, 114 Chase Side, London N14 6PN, telephone 01-896 6599 (24 hours).

DON'S DIARY

FRIDAY

En route at last for Mexico. Uniformed guards stare blankly from beneath dark glasses. The chatter of foreign tongues dominated by the rich brown tones of North America. Overhead the ceiling fans turn slowly. Why does Aberdeen Airport seem such an alien place in the early morning? Am off to Acapulco to attend the International Congress of Psychology, a week-long psych-fest which brings East and West, North and South together once every four years.

Am inauspiciously well prepared: transparencies typed not scrawled in illegible handwriting; talk written so no mind rush to complete before the in-flight movie; even little packets of Kleenex to guard against the rumoured shortage of toilet paper south of Rio Grande. Has any British Expeditionary Force left these islands better armed and equipped? Spoil it all by leaving tickets on the desk in the foyer, but air hostess very understanding.

SATURDAY

Fifteen hours later, circling Houston in a thunderstorm watching the wings vibrate and glow with static electricity. Finally we land in darkness and the cabin door opens to let in the first moist alien air. Excited chatter from Krystle and Alexis clones around me: they are going home. I suppress own Traditional Cultural Abreaction consisting of urge to stay in airplane for return flight to cozy UK. Pause at high altitude, above the customs, to regroup forces. Why does the world's most technologically sophisticated power have the ugliest sanitary and electrical fittings?

Nice lady on flight has directed me to the Marriott. So handy for your early flight and very comfortable. One hundred dollars a night? Outside the storm still rages and my stomach tells me it is really 4.00am. Forget the exchange rate and put this down to experience.

SUNDAY

My first experience of Mexico is a flight with the National Airline. As we take off, a loaded ice bucket travels the full length of the cabin, scattering its contents like diamonds beneath the seats. We swoop down eventually over verdant green coconut plantations with the blue ribbon of the Pacific as a backdrop. My hotel is the last drop for the airport bus: a sort of Spanish-speaking Biltmore, very jolly and rather noisy, with waiters called Manuel. The beach is magnificent, a great crescent of golden sand, which is almost too hot for bare British feet. Spend the afternoon relaxing, attentively watching the parasenders being dragged through the skies by powerboat and tending off itinerant sellers of coconuts, ice-creams, jewellery, miniature donkeys and their sisters. Retire easily with duty free Scotch to plot future strategy.

Wake up 12 hours later in much better spirit to face the conference. In the shower, mentally compose letter to the Scotch Whisky Association explaining virtues of brew for dissipating jet lag. Conference is in a magnificent convention centre, better than any British City can boast. At the front, free-lined drives and gushing fountains; at the rear, piles of sun-bleached broken chairs and abandoned equipment smothered in luxurious foliage. After the speeches, we swarm on to the Plaza for refreshments.

TUESDAY

No. Stretch my Spanish to the limit to acquire a bottle of peppermint flavoured sludge recommended by guidebook as cure for nausea.

Conference sessions are of varying quality: advertised luminaries frequently fail to turn up (or are cooped up in their hotels getting rid of tourists). As so often, as much is learned outside the formal sessions as inside: names on letterheads become faces; faces become friends. The latest news out of the laboratories in Washington State or Grenoble is yelled over the sound of roaring surf or chinking glasses: results which don't replicate. Chairs soon to be vacated, papers accepted and rejected. Priceless gems of academic gossip - I only hope I can remember them when I get home.

WEDNESDAY

Play hooky from the conference in the afternoon to go cruising in Acapulco Bay. Find the Russian contingent have also absconded en masse. They spend the first few minutes photographing each other with ancient Prakticas before getting down to the serious business of viewing the monuments of capitalist decadence: the homes of the film stars cantilevered out from the cliffs along the shoreline. As we edge out into the bay, a storm gets up; the samba beat of the band on the foredeck begins to falter and is then silenced altogether. Russians hang ignominiously over the side as the ship heaves in the heavy swell.

THURSDAY

Session ends this evening with a Fiesta Night. "Guests to wear national costume." After 18 years in Scotland I qualify for a kilt? Fiesta starts over an hour late due to non-arrival of visiting big-wigs. In Mexico power is measured by how long you can keep your hosts waiting. The singing and dancing are quite splendid but things go a little wrong at mealtime. Spread around the room are stalls, each dedicated to dispensing a different regional tidbit. When the signal for dinner is finally given, the by-now ravenous delegates descend on the stalls whose supplies of food are sadly inadequate.

FRIDAY

Plenary session of the International Union is held in the roof-top room of a tourist hotel. Session draws interminably as courtesy and reciprocity demand that nearly half the delegates nuzzle each other for the handful of places on the executive. Between bouts of voting, I cast my eye out of the windows where the rain has begun to fall like a curtain and the wind is tearing at the palm trees. At the end of the six-hour session, the streets are already awash and cars and buses are stalled at grotesque angles along the broad avenues. Back at the hotel, water dribbles steadily through the lighting fixtures in the restaurant, transforming parts of the tiled carpet into a swamp. It rains continuously for 20 hours.

SATURDAY

By now I have grown accustomed to Acapulco's mixture of tinsel and tawdriness. I can see, the right change on the buses. I can dismiss as sort of Spanish-speaking Biltmore, very jolly and rather noisy, with waiters called Manuel. The beach is magnificent, a great crescent of golden sand, which is almost too hot for bare British feet. Spend the afternoon relaxing, attentively watching the parasenders being dragged through the skies by powerboat and tending off itinerant sellers of coconuts, ice-creams, jewellery, miniature donkeys and their sisters. Retire easily with duty free Scotch to plot future strategy.

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Graham Davies

Taxing time for charter professor

by Paul Flather

It has been a busy few months for Professor Richard Layard. Strenuous efforts to produce a campaign to argue that unemployment is curable came to a climax this week with the launch of the Charter for Jobs.

At the same time he has been learning the intricacies of the University Grants Committee, to which he was appointed in December.

Professor Layard, who is professor of economics at the London School of Economics, played a key role in producing the charter and is chairman of its executive committee. It is the latest step in more than 20 years of involvement with public policy issues, which started when he was a history teacher in a comprehensive.

He was passionately that unemployment is the central issue which all economists should address and though he has been involved with the Social Democratic Party, and currently sits on its economic policy working party, he is willing to press policy points with anyone who will listen.

After studying history at Cambridge he began work as a teacher and registered for a part-time evening MA in sociology at the LSE. There he met Claus Moser who recruited him as full-time research officer for the Robbins committee investigating higher education.

Professor Layard believes it was in this post he may have done his important work in successfully exploding a common view of the time that there was a fixed pool or a "chosen few" who could benefit from higher education. Instead came the Robbins principle.

In 1964, just after the report was published, he helped set up the higher education research unit with Moser, and decided to become an economist because he felt this was ultimately the unifying discipline which allowed full consideration of social policy problems.

He did an MSc in economics, then joined the Labour Economics Department, becoming a reader in 1975 and taking over a personal chair in 1980. By then his main interest had switched from education to income distribution and so the unit was transformed into the Centre for Labour Economics in 1974.

By the end of the 1970s it was clear that unemployment had become the central issue and the centre, jointly backed as a designated research centre



Personal File

by the Economics and Social Research Council and by the Department of Employment, began to examine the problem through a series of seminars and discussion papers. This involves 10 LSE lecturers and a dozen "apprentice" researchers.

Professor Layard is perhaps best known for his idea of a tax-based income policy adopted as Alliance policy. The fear of inflation arising from measures to tackle unemployment, would be neutralized, he argues, if larger than average pay increases were simply taxed away.

It is this kind of thinking, within a neo-Keynesian framework, that underpins the new Charter for Jobs backed by 114 sponsors, including 16 economics professors, and other senior academics such as Professor A. H. Halsey and Lord Briggs of Oxford and Professor David Donnison at Glasgow University.

Professor Layard co-authored *The Impact of Robbing (1969)*, wrote a textbook on *Cost-Benefit Analysis (1973)* and co-wrote *Micro-Economic Theory (1978)*. His proposals for restructuring National Insurance contributions were largely followed in the recent Budget.

Professor Layard also heads a panel of the European Policy Studies Centre in Brussels and is convener of the LSE economics department. As he admits, it all leaves little time for his hobby of walking.

Wreaths laid for lab animals

by Olga Wojtas
Scottish Correspondent

More than 250 representatives of Scottish animal rights organizations laid wreaths at three alleged vivisection laboratories at Aberdeen University mark World Day for Laboratory Animals this week.

Professor Cecil Kidd, whose physiology laboratory was one of those targeted, said: "Of course we do experimental work which involves animals."

"This is very tightly controlled by the Home Office and they have expressed any disquiet whatsoever. The idea that it is done in any unsanitary, callous, unthinking way is pure nonsense."

But Mr Michael Deveria, co-chairman of Aberdeen Animal Rights Group, said they opposed all experimentation on animals.

Sir Aileen Williams, principal of Glasgow University, has written to the president of Pennsylvania University, seeking an explanation of correct claims by a former Glasgow law professor.

Professor Alan Watson, who is at Pennsylvania, warned Glasgow earlier this month that it risked damaging its reputation if it continued controversial collaborative research with monkeys.

Glasgow receives the frozen brain of monkeys which are subjected to pressure to create brain damage at Pennsylvania, and although the research was cleared by investigations of both universities, Professor Watson believes Pennsylvania's administration is "obstructing access to the truth".

Mr James McCargow, Glasgow registrar, said the university committee had been greatly concerned by Professor Watson's letter and confirmed that a next month's court meeting would see further claims of malpractice at Pennsylvania.

The Scottish Anti Vivisection Society has sent Glasgow an American government report, which severely criticizes the care of primates and other animals. It followed an inspection last summer by the US department of agriculture, animal and health service, and complaints of "cockroaches everywhere you look, mice and vermin droppings".

ETHICS

Thaw point of funds freeze

Conservative Party chairman John Selwyn Gummer's abrupt freezing of funds for the headline-stealing Federation of Conservative Students after its Loughborough conference begins to look a trifle ineffectual.

The main item in the FCS's annual budget is its chairman's salary, and Conservative Central Office has held outgoing chairman Marc Henri Glendening that this will continue to be paid.

So the draconian ban on spending now applies only to the telephone - FCS has been forbidden to make calls out of Central Office - and the use of that vital propaganda weapon, the CCO photocopier.

The Building Research Establishment has brought out a video teaching package for architects - on how to build a house. The two years' worth of course material, showing how the roof fits on the walls and which bits go up in which order, was produced by the University of Manchester Institute of Science and Technology in response to worries that graduate architects were being set loose on drawing boards without ever setting foot on a building site.

Accustomed as I am...

As a Harrow schoolboy Sir Keith Joseph won only one prize, but he was it every year: the prize for public speaking. He would troop up to the top table to collect it from Sir Winston Churchill, another Old Harrovian, who also judged the competition.

The secretary of state related this story at the National Institute for Adult Continuing Education conference in Surrey, before making his speech on adult education - a subject he admitted he knew little about - written by Gordon Etherbridge, his assistant secretary.

Banking on flower power

Working for the National Advisory Body has its perks. In the aftermath of the last allocation of public sector student numbers, a dozen red roses arrived for NAB administrator Doran Urwin. "From your secret admirer," said the attached card: a poetic tribute from South Bank Polytechnic of one rose per 500 full-time equivalent students.

There was also a postscript for John Bevan, the NAB's impeccable assistant secretary, which was never fulfilled but allegedly had him checking the lock on his office door. "Tell John Bevan Tarzanogram follows later".

Floored

The alarming picture appears in Glasgow University's Newsletter, purporting to be an exercise to show an arts faculty member failing to come to terms with the new technology. Finally, it is looking satisfactory relationship with the education validation authority.

Academic Validation in Public Higher Education, the Lindop report, is a 120-page study by HMSO.

Anthropologists defend their own race

by Karen Gold

A defence of anthropology as socially, culturally, intellectually and scientifically useful has been made to Mr Norman Tebbit, Secretary of State for Trade and Industry, by the director of the Royal Anthropological Institute.

Dr Jonathan Benthall, director of the institute, wrote to Mr Norman Tebbit after he publicly defended education cuts and said the Government had taken money away from people studying "the pre-nuptial habits of natives in the Upper Volta valley".

Dr Benthall argued that singling out social anthropology for disparagement was unfair. Mr Tebbit replied that scholarship, however interesting and valuable, depended on wealth creation for its finance. Dr Benthall has elaborated his justification in the RAI's new journal *Anthropology Today*.

Anthropologists are increasingly doing work which is related to British industry and the economy, argues Dr Benthall. In addition the study of primitive lifestyles has scientific importance for western society.

He instances health care, where primitive methods of treating the whole person rather than symptoms has influenced western medicine; the study of simple social structures which aids understanding of complex social processes such as economic exchange and decision making.

In an example unlikely to appeal to Mr Tebbit, Dr Benthall writes: "For instance it has often been claimed that inequality is intrinsic to all human societies. This claim is disproved by the existence of hunter-gatherer societies such as the Hadza of Tanzania who espouse a positive ideology of egalitarianism."

Anthropologists preserve cultural identity often dismissed by new societies but regretted later - for example an anthropologist is leading

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Mr Tebbit: criticized research

the campaign for better treatment of Aborigines that is now gathering support in Australia. Anthropology regularly act as an advocate for tribal groups in land rights cases. Development anthropologists contribute to the Overseas Development Administration

and other development projects. Almost every field of study had been influenced by anthropology and the ideas it produces. Dr Benthall cites Biblical scholarship and the theatre. Anthropology also helps break down prejudices between different societies, he says.

There are around 130 social anthropologists in British university departments. "Hardly a great drain on the Exchequer," he adds. Britain is regarded as an international centre of excellence and has a superb track record in funding which should be continued, although he accepts Mr Tebbit's argument that wealth creation is needed.

Mr Tebbit said in reply he was glad Dr Benthall accepted that. "Of course I could have instanced scholarship projects in almost every discipline (yes, even 'hard science') that are so remote from our present difficulties as to merit little expenditure," he said.

YTS managing agents 'rebuffed colleges'

by Patricia Santinelli

Colleges made strenuous and imaginative efforts to make their services to Youth Training Scheme managing agents over the last two years but were rebuffed, according to a Further Education Unit survey published this week.

The FEU's conclusions are based on its third survey of some 30 colleges in the Midlands and Cheshire. They directly contradict recent ministerial statements which claimed colleges made little effort.

The survey which covered 18 per cent of young people on the scheme in Britain shows that colleges actively marketed themselves, but that managing agents' reactions were disappointing.

"As recruitment failed to reach targets, shorter courses were re-

quested with less scope for innovation. While some managing agents began by negotiating with colleges in a dogmatic prescriptive way, only to turn to other training agencies later," the report says.

The survey also shows that managing agents on Mode A employer-based courses in urban areas recruited better applicants and used more private training agencies, leaving colleges with a larger proportion of Mode B recruits who were initially considered unattractive to employers.

The FEU explodes the myth that the extended college year was vital. It says that it proved less necessary than expected because so many standard further education courses were requested. In addition it says that a "roll-on/roll-off" facility was found to be incompatible with traditional ex-

amination courses. Its investigation of subjects covered by colleges under the YTS reveals that science, maths and computing accounted only for just under 4 per cent of the work, and art, design and photography for less than 2 per cent. The highest percentage was for general liberal studies, adult education and vocational preparation which accounted for over 26 per cent of the work, followed by mechanical electrical, crafts and engineering technology and automobiles.

Without exception the colleges involved with the survey sought to provide full and equal opportunities for all groups of YTS trainees, but results also indicate that black young people were underrepresented and their choices reflected their cultural differences.

Official plans may be shelved

Leaders of the university lecturers' union want to shelve plans for a further regional official and raise subscriptions by almost 13 per cent to avert a £122,000 deficit next year.

The Association of University Teachers already has regional officials in London, Manchester and Edinburgh, and last year the union's council voted in principle to appoint a fourth, possible in the West Midlands or Wales.

But the decision was subject to guarantees that sufficient extra income could be generated to cover the estimated £45,000 of an additional regional office. And the union's May council in Glasgow will be told that the deficit for the current year may reach more than £41,000 with an estimated £122,000 shortfall in 1985/86.

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POSTCODE

Union gets tough

by David Jobbins

University lecturers accused of sexual harassment face losing union support under new procedures expected to be agreed by the Association of University Teachers next month.

The AUT adopted a code of practice outlining ways of combating sexual harassment last December but left it to its executive committees to agree on detailed procedures.

Initial proposals from the union's women's committee dealt largely with the case of an AUT member who alleged unacceptable behaviour by another university employee. But other union leaders have been concerned that complaints are also likely to be levelled against AUT members possibly by students, and have argued that their plight should also be considered.

But the latest proposals from the union's conditions of service committee, which are likely to be the final version to be considered by the executive next month, take a tough line.

AUT members who consider themselves the victim of sexual harassment should tell the aggressor they find the behaviour offensive and ask for it to cease. The advice and support of local AUT officers should be sought and if the harassment persists a diary of events should be kept.

But the women's committee is anxious that complaints of sexual harassment should not necessarily enter the arena of disciplinary proceedings. Its chair, Ms Victoria Fisher, told the AUT annual women's meeting last week: "By firm action on the part of the victim and the union we would hope a lot of cases would cease at that point. We are trying to create a climate of opinion which condemns sexual harassment before cases come up."

The union will refuse to aid any member who admits sexual harassment beyond arguing that any disciplinary procedures are contrary and fairly followed.

Advice would be given however on what the procedures were and where it seemed that an allegation had been fabricated, members would be protected.

The women's committee will discuss the issue with the National Union of Students women's committee in June.

PNL staff may take race lesson

by Karen Gold

Staff must attend racial awareness courses, and curriculum and teaching practices on all courses must reflect a multi-ethnic policy, says a discussion document from a governors' working party of the Polytechnic of North London.

The working party, headed by PNL's two black governors, was asked to create an anti-racist strategy by the acting director Dr John Beishon. PNL has suffered two years of disruption as students have clashed in the streets and the courts with National Front activist and philosophy student Patrick Harrington. The polytechnic has, says the document, "a unique opportunity to take a lead, and by doing so hopes to influence similar institutions."

The working party which wants responses by May 6, recommends

changes in the polytechnic's structure, recruitment, courses and allocation of resources. Its most controversial recommendation is likely to be that "all members of staff must attend suitable in-service training in equal opportunities, racial awareness and other connected multicultural matters".

The director, secretary and administration should seek to ensure that all staff attend such courses, and the polytechnic would seek union agreement that attendance be mandatory. Priority in staff development resources would be given to such courses.

In developing courses, priority will be given to those that meet the needs of ethnic minorities, the report recommends. Admissions tutors should receive special training and all course tutors and advisers would be expected to know about the cultural back-

grounds of students.

Curriculum and teaching practices of all courses should reflect the polytechnic's policy on multi-ethnic education and equal opportunity, and assessment and examination should be "appropriate to students in a multi-cultural society". Heads of departments would be responsible for ensuring teaching material was not racist, and library material should reflect a multi-ethnic policy. But the document stresses that freedom of research and expression to discuss contrary opinions should not be prejudiced.

The report recommends a permanent equal opportunities subcommittee of the court of governors and academic board, which would monitor staff appointments and encourage through appointment of ethnic minority staff.

East and West mark VE day

Edinburgh University is to mark the fortieth anniversary of the end of the war in Europe.

The lectures have sprung from "Edinburgh conversations", annual formal talks held under the auspices of the University, between small groups of British and Scottish experts.

On the move

Film producer David Putnam has been appointed to the visiting professorship of the Royal College of Surgeons in Edinburgh. The new chairman will be former consultant Mr Robin Holland, the former financial secretary of the London School of Economics and another new member, Mr Nick Butler, a design consultant.

Lucky fellows

The Government is to fund two awards to enable medical graduates from Malawi to study for the following year at the Royal College of Surgeons in Edinburgh. The awards are being provided to mark the state visit of Britain of Malawi's president, Hastings Banda, who received part of his own medical training at Edinburgh.

Social secretary

Mrs Suzanne Reeve, assistant secretary at the Department of Health and Social Security, has been appointed secretary of the Economic and Social Research Council, to succeed Cyril Smith. Mrs Reeve, aged 42, has previously worked in the Office Research Unit and the Civil Service Review Staff. She takes up her new post in September.

Empty chair

Britain's first professor of psychology is unlikely to be in place until January, Edinburgh University says, which is establishing the chair with £700,000 bequest from the late Arthur Koestler, had hoped to set up a professorial unit for the coming year. But a number of the candidates on the short list will not be free to take up the post until after next year.

Trial guide

The Royal College of Physicians has been presented with a set of guidelines to protect students who take part in pharmaceutical trials. The guidelines have been drawn up by the National Union of Students after the death of a Welsh medical student.

would become all the healthier for it. Variety and choice we need, but binary we do not. It has not meant "equal but different" only different but not equal.

The influx of 30 more institutions as universities might, also, help break down the entrenched resistance to the growth in this country of the Technic ethos. There would be less of the cultural blockage. Higher proportions of our brightest and best people would be absorbed into a polytechnic culture because they would be part of it - in a so-called university.

Some of the leaders of the polytechnic world are currently in the market for a new start. They deserve encouragement. A bold message could come down from the top. Sir Keith Joseph could make a point of symbolic gesture by signing the DES honours list containing that "distinction" in a polytechnic world is rewarded by the most by a CBE, whereas the university world collects honours by the shovelful and even odd peerage.

Keith Hampson

The author is Conservative MP for North West.



Bob Geldof: honorary MA

Graduate power summit

by John O'Leary

A summit meeting of higher education planning bodies is being sought to confront a looming crisis in the supply of graduates qualified in power electrical engineering.

Representatives of the Institution of Electrical Engineers and the National Economic Development Office met this week, reflecting widespread concern over future members and quality of electrical taking, electrical power supply. But a new report from the NEDO called for a wider forum to discuss ways of achieving a more satisfactory output.

The problem identified in successive reports by the NEDO and the IEE was from power teaching being spread too thinly across higher education. More than a third of departments involved have fewer than 10 students taking power, options in the final undergraduate year and almost half employ fewer than five staff specializing in the area.

Demand from employers is expected to rise by about a fifth, but students are tending to concentrate on the vogue area of electronics.

The NEDO report contends that there does not need to be a substantial increase in student numbers, but action is needed to maintain the existing level of supply and improve quality.

The designation of up to a dozen centres of excellence is advocated as a response to the problem, although the NEDO accepts that this would not necessarily encourage more or better students into the subjects. Company support and public resources would then be concentrated on the centres.

Initial soundings with the University Grants Committee and the National Advisory Body elicited little enthusiasm for protecting power teaching capacity or designating centres of excellence. Although employers could direct their main sponsorship towards a particular group of departments, the NEDO report recognizes that NAB and UGC involvement would be needed to make the scheme work.

For this reason a round table meeting of the two planning bodies with the IEE, the Science and Engineering Research Council and heads of electrical engineering departments is proposed to consider how centres could be set up.

Multiracial training success

Non-participants on the National Programme for Teacher Training have gained greater insight into this problem and issues in multicultural education, racism and anti-racist teaching, according to a preliminary survey.

The survey was conducted by Professor Maurice Craft, who coordinated and launched the national programme of short courses in 1982 in the wake of the interim report and a recommendation of the House of Commons that there was an urgent need to train teacher trainers in forwarding multicultural objectives.

There are now 18 universities, polytechnics and colleges of higher education involved in the programme and more are currently involved in discussion. The first six centres were Liverpool, London and Nottingham, Manchester, Oxford and Birmingham. Many have since joined polytechnics.

Kent gets it back together, man

by Peter Aspdin

Graduates of Kent University have been asked to unearth their old floral kaftans, beads and acoustic guitars to celebrate the university's 20th anniversary with a nostalgic look at the 1960s.

They have been invited to a reunion weekend which aims to recreate the unique atmosphere of Kent's first years, which has been variously described as "heady", "swinging", "laid back" and "tumultuous".

Among the weekend's attractions are a picnic in the tranquil surroundings of the university's Keynes Pond, and a free-for-all "jam session", in

which former members of student bands will be able to recall long-forgotten skills and improvise with each other, paying scant regard to traditional forms of musical structure.

Mr Roland Hurst, assistant registrar at Kent, said: "The idea is to put on something which people will enjoy. Many of our graduates will be in their mid to late 30s, who wouldn't be attracted all the way to Canterbury by a speech and an expensive dinner. Not all of them are exactly well-heeled."

The permissive air of the reunion is reflected in the invitation to old Kent members, which encourages "children, husbands, wives, lovers and

friends" to attend, although there are no explicit references to peace anthems, free love or Jont Mitchell.

Perhaps to prove that the university is firmly in touch with the 1980s, Kent this week announced the award of an honorary degree to Mr Bob Geldof, lead singer of the Boomtown Rats and organizer of the Band Aid charity recording which raised more than £8 million for the relief of famine in Ethiopia.

Mr Geldof, who lives near Canterbury, will receive an honorary MA for co-writing the chart-topping single *Do they know it's Christmas?* and helping to promote it round the world. He was 14 when Kent University was founded.



IT'S JUST LIKE THE OLD DAYS - LATER ON WE'RE THROWING YOU ALL OFF CAMPUS!

There is good news on the tax front for British students and scholars intending to go to the United States. Up to now, foreign students have been considered as non-resident immigrants, and their incomes have been taxable if they were going to be in America for two years or more.

But under a new tax code they will not be considered US residents for tax purposes during their first five years of study, regardless of whether or not they return home for summer vacations.

And there is a possibility that the five-year period will be extended, provided the student can show that he or she does not intend to live permanently in the United States and continues to comply substantially with the terms of admission.

There are complications, of course. The US income tax return makes its Inland Revenue equivalent look like an English primer.

Fears grow for physics department after admissions row

by Peter Aspdin

Concern has been mounting over the future of the physics department at Birkbeck College, London, following a row over the admission of undergraduates.

The debate started when a college planning committee decided that no new undergraduates should be admitted from next year - only for that decision to be later overruled by the

academic board. But a plan to scrap one of the department's MSc courses is still under discussion, sparking fresh fears that the department is to be run down over the next few years.

The head of the department, Professor John Hasted, said there was still some doubt about the future of MSc courses. "But we will be admitting undergraduates next year, which is the most important point to make," he

said. The discussions within the college have been further complicated by a recommendation accepted by the university's joint planning committee, that the college joins forces with University College for the future teaching of physics.

The recommendation, which came from the physics board of studies, urged the two colleges to form a joint department, but guaranteeing Birk-

beck's unique role within the university for part-time teaching.

Professor John Chirap, a board of studies representative on the senate, said there had been widespread concern over the future of the department in the light of the college's proposals.

He wrote to London's vice-chancellor, Professor Sir Randolph Quirk, who replied that he was making inquiries into the matter.

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Keith Hampson

The author is Conservative MP for North West.



A memo from a 'Lancashire Polytechnic' exhibition "Recovering our Past", containing items dated 1900-1959 lent by Preston people. The exhibition preceded the launch of the polytechnic's local history project this week by former England and Preston footballer Tom Finney, who lent his OBE.

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PARTY LINE

The polytechnic name game

local authority institutions does not help the image problem.

But it is a problem which can be simply resolved - they should simply name themselves universities. After all, what is in a name? Some would say that it would merely encourage them to academic drift - the traditional transformation of higher education institutions towards the traditional Oxbridge pattern. Look at the CATs they will explain.

This is a load of nonsense these days. For a start, the former CATs are quite different as universities from a great many others in the system. And the system itself has become a very plural one indeed, ranging from Oxbridge to Salford, from St David's to Lancaster to Glasgow. The polytechnics could be perfectly at home without changing their character or direction. They need become no less involved with their local communities, nor any

less vocational or relevant.

The problem is with the way they are seen - which differs vastly from the vision of Toby Weaver, the polytechnic's progenitor in the early 1960s. It is a professor from a local university who is normally the choice of a local television station looking for an expert to comment on some local issue on current affairs. It is seldom anyone from the local polytechnic.

Though the old civic universities may have succumbed to the Jowett-inspired Oxbridge model, that model is not in fashion today. Today the universities strive to prove they are polytechnics. All the emphasis is on their relevancy, their role in the community, their help for industry and their technological parks.

One may regret the obnoxiousness that lies behind the public's perceptions of the two types of institution, but after 20 years of being seen as

second best, isn't it time that the polytechnic world stopped instinctively baulking at the obvious and necessary change? Some polytechnics created professors some years ago. The obvious next step is the adoption of the university title, which does not even need a royal charter or Government action.

We have to recognize that the world operates by symbols. The title "professor" like "university" is a symbol of more prestige. That being so, it is foolish of those who cherish the original polytechnic tradition to undervalue it by refusing to adopt what they believe is an alien nomenclature. It is not a betrayal of a principle; it is nothing other than recognition of reality. It would not be saying goodbye to a perfectly valid dream, only refocusing and rejuvenating it. If the polytechnics are to have an optimistic future, they need some opportunism. But British higher education as a whole

Keith Hampson

The author is Conservative MP for North West.

The next step for women

A decade after equal opportunities legislation, the onus is now very definitely on women to help themselves, Lady Elspeth Howe, formerly deputy chairman of the Equal Opportunities Commission, told a conference on second chance education and training for women last week.

Currently women were living through an equal opportunities transitional stage, she said. The need now was for women to take the initiative, particularly in negotiating their family responsibilities on a more fairly shared basis.

Second chance education via a "ladder of learning" was a prerequisite for the full deployment of women's talents. Lady Howe said, describing opportunities offered by the Open University as "the best thing for women since sliced bread".

But much remained to be done, especially by schools. Although opportunities were theoretically equal, the educational process continued to be biased against girls.

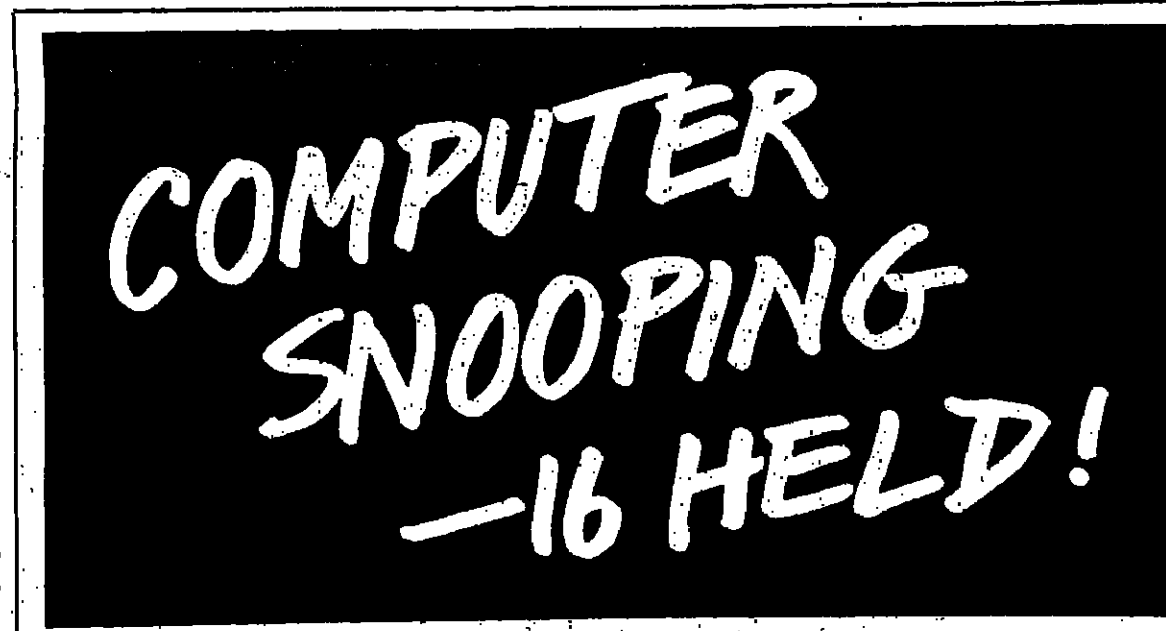
The one-day conference was organized in London by the Industrial Society in conjunction with *Good Housekeeping* magazine and attracted such an overwhelming response that two similar conferences will be staged later this year.

Multiracial training success

Non-participants on the National Programme for Teacher Training have gained greater insight into this problem and issues in multicultural education, racism and anti-racist teaching, according to a preliminary survey.

The survey was conducted by Professor Maurice Craft, who coordinated and launched the national programme of short courses in 1982 in the wake of the interim report and a recommendation of the House of Commons that there was an urgent need to train teacher trainers in forwarding multicultural objectives.

There are now 18 universities, polytechnics and colleges of higher education involved in the programme and more are currently involved in discussion. The first six centres were Liverpool, London and Nottingham, Manchester, Oxford and Birmingham. Many have since joined polytechnics.



No, it's not out of "The Hackers' Guide". Just the geography department determined to discover what the zoology department is doing with the Plotmate. Plotmate is the new rugged, responsive flatbed plotter that takes all the colour, vector, character and graphics commands of a BBC micro.

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Phone 0702 541664 for details, and keep hacking out of colleges.





Unionists against a Unionist

The 55th Women's TUC Conference took place in Southport last month. More than 300 delegates representing four and a half-million working women gathered to confront the massive problems women now face as a result of the recession and the policies of the Thatcher government.

One of the highlights of conference was an emergency motion put forward by the TUC Women's Advisory Committee (and carried unanimously) in defence of the right of young women under 16 to get confidential help and advice on contraception from their doctors. The motion was in response to the Appeal Court ruling supporting Victoria Gillick, which has made it illegal for doctors to give such advice without parental permission. Discussion on this was followed immediately by a further statement from the Women's Committee (also unanimously endorsed) calling for the defeat of The Unborn Child (Protection) Bill sponsored by Enoch Powell.

Part of the legacy of the women's movement of the last 20 years has been the growing recognition among trade unionists that women's employment rights are indivisibly linked to the development of other areas of social policy, including the right of women to control their own fertility and determine for themselves, if and when, they wish to bear children. Now the women's rights movement has demonstrated its own commitment to women's rights.

At the National Abortion Campaign which, throughout the changing political circumstances of the last ten years, has maintained broad-based campaigning support both inside and outside Parliament.

Because the link between the Gillick case and the Powell Bill was not immediately obvious, members of the TUC's Women's Committee pointed out that while the Gillick judgment leaves already vulnerable sections of young women even more at risk of unwanted pregnancies, the Powell Bill, if passed, will be used as a legal basis for an attack on both contraception and abortion.

Woman after woman came forward to spell out the dangers of the Gillick decision. While illegitimate pregnancies in cities like Glasgow are already running at one in four, the Family Planning Association has already had to withdraw education leaflets aimed at young people.

The Powell Bill has become the target of increasing opposition including, to his credit, opposition from the Minister for Health, The Bill aims to stop embryo research. The title of the Bill is highly emotive, and attracts attention from the two main objectives of such research: to improve the treatment of infertility and to prevent abnormalities or handicaps in children. The Bill proposes the Warnock recommendations, would probably wreck embryo research and would drastically reduce the number of women treated for infertility. Every woman seeking such treatment would have to apply individually for permission for treatment to the Secretary of State.

It remains to be seen whether the Powell Bill will become law. What is clear, however, is that "women's right to choose" is once again in danger, and the trade union movement, led by its women activists at the Women's TUC, is preparing once again to go on the offensive.

Patricia Leman

Patricia Leman is a member of the TUC Women's Advisory Committee and a member of the National Abortion Campaign.

Felicity Jones on the Workers' Educational Association's biennial conference

Funding row 'end in sight'

The search is in hand for a peaceful solution to the clash between the Workers' Educational Association and the Government over the planned change to its grant formula.

Following the Secretary of State for Education's conciliatory approach at the National Institute for Adult and Continuing Education study conference last week, Professor Bernard Jennings, WEA president, told the biennial conference at York University that he hoped the 8.3 per cent cut in budget would be restored and the formula put on a rational basis. WEA officers will meet Sir Keith Joseph next month.

Although the grant had increased by significantly more than the rate of inflation over the past four years, this had done no more than compensate for the fall from 20 to 11 per cent in local

authority grants. Professor Jennings called on the Government to reject the "poisoned chalice" of short, popular and undemanding courses. "What we do turns inexorably into what we are," he said.

"It is what we are, an organization devoted to academic values and the creation of an educated democracy, which attracts the voluntary workers without whose commitment the association would be an empty shell."

Mr Peter Jackson, chairperson of the WEA's north-western district, spoke to an emergency motion carried by the conference, which opposed the attempt to base funding arrangements on a formula which would be effectively tied to student hours.

"This is a very questionable ethos for the WEA to follow. Like Lever Brothers instead of selling soap powder, we are being asked to sell bottoms on seats," he said.

The formula plans would create damaging competition, limit freedom of student choice, discourage quality, reduce the work with the working class and disadvantaged groups and deter students from becoming active voluntary members, Mr Jackson added.

Describing this as the most important issue facing the WEA, the district warned that "a nightmare of uncertainties and bankruptcies" would follow in the wake of a new formula.

Mr Linden West, the secretary of the Berkshire, Buckinghamshire and Oxfordshire district said: "The whole thing was cooked up by one official and having made a silly error the problem is now how to extricate ourselves. Sir Keith will listen even at this eleventh hour to the extent of the damage which might be caused."

Dogged by wifely role

The wifely role has dogged the Workers' Educational Association since the start.

The eight vice-presidents are men, as are all the national officers and only 22 per cent of district secretaries, tutors and organizers are women.

Ms Kay Phillips, of the Association of Scientific, Technical and Managerial Staffs, told the conference that the first person to found the Mansbridge signed up was a woman.

"Women have had a tendency to continue in these wifely roles since," she said. Delegates supported a motion for the Central Region calling upon a national executive to get women appointed to non-elected vice-presidential posts.

But this was opposed by national executive member Miss Mary Lee who spoke against tokenism.

The association is to review a recruitment and selection procedure for posts and districts are to be asked to increase special courses for women in paid work and to better educational leave.

Working group set up for blacks

A working group to develop courses for the black community which have a majority membership and be chaired by a member of the ethnic minorities is to be set up by the association.

The group will oversee the development of courses for the black community which have a majority membership and be chaired by a member of the ethnic minorities is to be set up by the association.

Peace studies to be expanded

As one of the most authoritative and major providers of liberal adult education with over 180,000 enrolments last year, the WEA has made the controversial move of including peace studies as a legitimate area of study.

The report of the working group convened by Dr John Field, recently appointed to the National Institute of Adult Continuing Education executive committee, recommended that districts should extend and develop their provision in line with a 1981 resolution which asked the association "to explore ways of increasing the study of international understanding, especially the problems of disarmament and peace."

The association has studied the general topic since 1914 when branches explored the background to the Great War and continued with peace and disarmament in the 1920s and the

role of the League of Nations. The report accepted the controversial nature of peace studies but saw this as an educational virtue, not vice, especially as adult students were capable of distinguishing between propaganda and education.

"The independence of the WEA, combined with its tradition of student democracy, should be sufficient to guarantee that all views are given a hearing and that no course is simply camouflage for propaganda," said the report.

Adult education in general and the WEA in particular "has not and must not shy away from controversial teaching areas simply because they are controversial and problematic."

A motion was passed calling upon districts to develop courses in political education and to support the working group's initiative on peace studies and

by setting up local projects.

Miss Kathleen Hobson, (Stockton and Billingham branch) said they should resist the censorship of knowledge. This was the view that saw politics as a respectable subject of study at Oxford and Cambridge because students could be trusted since they would go on to take up power. It was different for working class adults studying in community groups and village halls.

Professor Jennings, the president, warned against using the classroom for propaganda. "The place for propaganda is the political parties or pressure groups not the WEA class."

"On the other hand to refuse to deal with controversial issues is itself a kind of propaganda or a belief in leaving it to the experts which is inimical to the idea of democracy."

Joint intake prompts talks on merger

Wolverhampton Polytechnic and West Midlands College are discussing a formal link of any kind, from association to merger after being given a joint teacher education intake by the National Advisory Body.

The intakes proposed by the NAB secretariat would be an increase on the total intakes of the two institutions at present, and a potential lifeline for West Midlands, which is having to phase out its diversified courses on NAB orders by 1986.

Primary, intermediate, certificate numbers would double by 1988 from 30 to 60 across the institutions; primary BED places would go from 150 to 220; secondary PGCE numbers would stay at 90 and secondary BED would go from 40 to 90. At present West Midlands offers BED to 13 and PGCE for primary and secondary.

Discussions have already taken place between the two on collaboration in in-service teacher training. But there has been no discussion on initial teacher education before the NAB letter, according to West Midlands principal Mr Tim Cox.

The NAB letter says there would be a joint intake and it would be up to the two institutions to get together and decide on the best arrangements for apportioning the numbers, he said.

"If we have certain strengths and they have certain strengths it might seem sensible to locate particular strengths in one campus and others in the other. The letter from the NAB positively recognizes the strengths of the two institutions in teacher education."

The Council for National Academic Awards has written to Wolverhampton saying it is interested in being involved in any developments with West Midlands according to the polytechnic's deputy director, Mr Michael Harrison. The polytechnic planned to have discussions with its local college and with the college's local authority. Whilst in order to work out details of the collaboration by the autumn.

Protest over Belfast photographs

A touring exhibition of photographs, on show at Belfast College of Technology, has prompted a politician to write to Northern Ireland education minister Nicholas Scott.

Official Unionist in the Northern Ireland Assembly Mr Frank Millar says the display, entitled "Belfast Exposed", and featuring slums, squalor, brutal police and aggressive soldiers, amounts to mere Republican propaganda. The scenes of appalling poverty give no hint of the urban development and renewal plans which have already begun to transform the city, he says.

His letter to Nicholas Scott questions whether educational institutions should provide a platform for "such straightforward propaganda which might be acceptable in a school centre". It also asks if it is fitting that it should be funded by the public purse.

Mr Millar says he was summoned to the exhibition by a member of the college staff. He saw photographs which gave IRA men with guns, a folk, romantic, left-wing slant and set him away with an impression of "politeness with their arms wrapped round the necks of repressed working-class people".

Mr Millar's stance has triggered off protest among students both at Queen's, where the exhibition has already run for two weeks, and at the college, whose student union maintains he has condemned a whole exhibition on the basis of a few photographs he finds objectionable.

In a statement the union charges that, in an attempt to induce sectarianism, "a student body which has proved extremely effective in bridging the sectarian divide" is being divided. The exhibition was intended to broaden links between the two communities.

The exhibition, 300 photographs which kept being changed, was organized by a group of student photographers. It has already gone to library and lecture centres in both Catholic and Protestant Belfast, as well as to London, at the invitation of the GLC, to Geneva and to Dublin.



Hot off the press: the first of 300,000 guides for applicants through the new Polytechnic Central Admissions Scheme, displayed by chief executive Tony Higgins (right), and publications officer Paul.

Scots teachers 'need tradition'

Scotland's seven colleges of education should ensure that Scottish cultural traditions are given due prominence in teacher training.

This is one of the key recommendations of the two-year Scottish Resources in Schools Project published this week by the consultative committee on the curriculum.

The project team was largely made up of lecturers from Moray House and Aberdeen colleges of education, and coordinated by Mr Eric Simpson, head of Moray House's history department. It adds that over the years colleges of education "have produced valuable material on language and literature, traditional dance and folklore and social and environmental studies."

But, there is a need, for closer cooperation and the project urges the colleges' committee of principals to produce a catalogue of relevant publications. It also recommends setting up a central information centre which could liaise with the

colleges. But providing resources is only part of the solution, it says. "All the traditions of higher education, especially the colleges of education, should ensure that the Scottish dimension of teacher training is prominent."

It recommends in particular that strongest possible efforts should be made to train teachers to develop a "sound attitude" towards the language and literature of Scotland.

Scotland has an extensive and rich literature encompassing poetry, plays, songs, folk tales and legends, says, but teachers have been slow to become aware of this range.

Hospital opened after 14 years

Mecca for high tech medicine, opened in Aachen. The city set up medical faculty at its technical university in 1966 as an experiment and in 1980 students at the university, number 3,000 will study medicine and surgery, dentistry, at the new hospital.

The hospital has been at the centre of a construction scandal and was delayed in being completed in 1978. It took 14 years to build with a cost of DM600 million. It was described by a "milestone in the history of unique higher education."

Sri Lankan corporate plan envisages switch to science

The Sri Lankan University Grants Commission has delivered its corporate plan for the period up to 1988 despite continuing uncertainty about the immediate future of the university.

The plan also envisages the emergence of centres of excellence in the university system where there will be a concentration of academic resources in one or two departments. The University of Peradeniya, where there is a postgraduate institute of agriculture, is recognized as a centre of excellence in agricultural studies at Kelaniya University and of management studies at Kotte.

Discontent fuels fears of Finnish brain drain

It averages about £20,000 a year, with the Helsinki cost of living well above those in London and most other European capitals.

Discontent, as many as 29 per cent of Finnish professors remain "very well motivated" and a further 58 per cent "quite keen" on their work. Eighty per cent thought they were respected, both within the universities and outside. The lion's share would be unwilling to move into another profession, though 70 per cent admitted an interest in collaborating with business.

No curbs on entry to IT courses

West Germany's most beleaguered university subject, computer science, will not have to comply with entry restrictions being overcrowded by more than 180 per cent at most German universities.

In a surprise decision following drawn out discussions among West German politicians and academics, the council of the Central Admission Agency (ZVS) in Dortmund announced that it would not introduce the so-called "numerus clausus" restrictions.

Australians in joint bid to promote research

The first meeting to be held of representatives of the entire scientific and technological fields in Australia was convened last week in Canberra to develop a concerted programme in support of research and development.

The meeting brought together the elected leaders of Australia's 68 scientific and technological societies and two national academies. Those attending the meeting represented more than 100,000 Australians working in the scientific and technical areas.

Underground grants on offer

Polish scholars prevented for political reasons from continuing or commencing research projects can apply for support from the "unofficial" Social Committee for Learning (SKN) according to recent announcements in the Solidarity underground press.

Three types of two-year grants are available, depending on the applicant's academic degree and proposed research. The grants match the pay-scale for researchers with comparable qualifications within the state structure. Special grants are also available for scholars engaged in "writing or editing text books for the 'self education' circles which spring up among students and workers during martial law as successors to the "Flying University" of the pre-Solidarity period.

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overseas news

WEST COAST



University of California police move in to arrest demonstrators protesting against the university's investments in South Africa. Around 2,000 people took part in the week-long demonstrations on the steps of Sproul Hall on the Berkeley campus, and more than 90 arrests were made. The demonstrators had camped on the steps for a week before police moved in.

No curbs on entry to IT courses

from Barbara von Ow

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The decision has come as a relief to federal education minister Dorothee Wilms who has consistently urged the retention of open access to informatics. She reaffirmed that computer science had a key role in ensuring the international competitiveness of German science and technology.

Indeed the decision to keep admissions unrestricted was undoubtedly linked to the government's announcement that it would give the regional Länder an annual DM25 million to improve teaching facilities for informatics.

One of the youngest subjects in West German higher education, informatics has witnessed a dramatic expansion since it was first introduced in the late 1960s. Over the past decade, the number of student beginners soared from less than 1,000 in 1973 to over 4,700 this year. Currently over 20,000 students are crowded into less than half available places. As a result, the average degree time has already risen to over 14 semesters.

But although by now there are some 10,000 qualified computer scientists working in West Germany, it is estimated that industry will need at least 4,000 more each year to cover its needs. However, so far less than 50 per cent of the planned 4,000 student places are available and some universities have started to introduce restrictions locally.

Indeed the rectors conference had repeatedly urged stiff nationwide restrictions on the subject for at least two or three years, mainly because 20 per cent of the professional teaching staff were still unemployed due to lack of highly qualified candidates.

The administrative details of the scheme are: for obvious reasons, a closely guarded secret, and the announcements of the awards give no clear direction as how one is to apply.

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from Geoff Maslen

MELBOURNE

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The meeting brought together the elected leaders of Australia's 68 scientific and technological societies and two national academies. Those attending the meeting represented more than 100,000 Australians working in the scientific and technical areas.

The meeting was organized by a 16-member national committee for promoting science and technology which was set up last November by the Australian Academy of Science in response to widespread concern at the low political standing of scientists and technologists, following cuts to research funds in last year's federal budget.

The committee invited government ministers with science and technological portfolios, opposition spokesmen, heads of government science departments and other scientific bodies to the meeting.

Concern has been growing for a decade as successive Australian governments, trying to keep in power by backing more electorally popular issues than science, have continued to downgrade support for basic research.

Scientists in higher education and outside research bodies have pointed to the dangers of Australia losing its place as a leader in certain fields of research to European and some Asian countries.

The national meeting decided to set up a federation of Australian scientific and technological societies to provide an organized focus and continuity of activity. It also agreed to the establishment of a secretariat on science, technology and government relations.

The idea of a science and technology information service for the media, politicians and education was also discussed.

The representatives agreed that money should be raised from the science and technology societies and from industry and governments to support the new ventures.

The federal minister for industry, technology and commerce, Senator John Burton, defended the Hawke government's record of support. He said Australia's total research and development budget would show a 33 per cent increase by the next financial year.

It is clear, however, that the scheme has the tacit approval of a significant number of Polish academics, since applicants have to submit not only an outline of their proposed research and details of their financial situation, but also a recommendation from a senior professor or equivalent.

Furthermore, the payment of the grant is dependent on a favourable progress report every three months, from the researcher's "director of studies".

According to the SKN's own "information service", last year it financed research in economics, post-war history, and the "destruction of the environment" and provided support for self-education courses in philosophy and political sciences.

How many scholars have benefited from the scheme is likewise a secret, though one grant-holder has guessed that the number is "somewhere between 20 and 50".

Underground grants on offer

Polish scholars prevented for political reasons from continuing or commencing research projects can apply for support from the "unofficial" Social Committee for Learning (SKN) according to recent announcements in the Solidarity underground press.

Three types of two-year grants are available, depending on the applicant's academic degree and proposed research. The grants match the pay-scale for researchers with comparable qualifications within the state structure. Special grants are also available for scholars engaged in "writing or editing text books for the 'self education' circles which spring up among students and workers during martial law as successors to the "Flying University" of the pre-Solidarity period.

The administrative details of the scheme are: for obvious reasons, a closely guarded secret, and the announcements of the awards give no clear direction as how one is to apply.

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It is also noted that Sri Lanka spends less than 15 per cent of its total expenditure on education on university education, and less than 1.5 per cent of the GNP. Fewer than 30 of 173 developing countries spend less on higher education, the plan says quoting the Unesco Statistical Year Book.

US staff win big pay rise

from William Norris

WASHINGTON Faculty at American universities have received their largest pay increase since the 1960s. At an average of 6.6 per cent, the rises are almost double the rate of inflation in the United States - currently running at about 3.5 per cent.

This is the fourth year in a row that faculty pay rises have exceeded the rate of inflation. Mr. W. Lee Hansen, chairman of the American Association of University Professors' committee on the economic status of the profession, sees this as signalling the start of a more sustained effort to restore the real level of faculty salaries to what they were a decade or more ago.

Mr. Hansen credits the achievement to a number of factors. The relatively low rate of inflation, the strong growth of the economy, the rising growth rate of the gross national product, and an increase in real disposable income have combined to ease the financial position of colleges and universities. For the first time since 1980, salary increases for faculty at public institutions exceeded those at private colleges. For all ranks and categories combined, average salary levels in the public sector rose by 6.9 per cent, against 6 per cent for private faculty and 5.8 per cent for those at church-related colleges.

Average salaries at all institutions are now \$39,870 for a full professor, \$29,910 for an associate professor, \$24,610 for an assistant professor, \$22,020 for a lecturer, and \$19,150 for an instructor.

But the AAUP claims that faculty salaries still have a long way to go before they return to the level of the 1960s and early 1970s. The association's report says: "Average salaries for college faculty have fallen behind private sector jobs requiring comparable skills, and when compared with other groups of employees... only college and university professors suffered substantial declines in real salaries in the same period."

Mr. Hansen believes that an increasing public awareness of the needs of higher education should help to raise faculty salaries "so as to prevent valued faculty members from being lured to other sectors of the economy, and attract into the profession talented young people who will become the scholars and teachers of the future."

Percentage increases in faculty salaries from 1983/84 to 1984/85

Academic Rank	All	Public	Private	Church
Professor	6.7	7.0	6.1	5.9
Associate	6.4	6.8	5.8	5.8
Assistant	6.6	6.9	6.0	6.7
Instructor	6.2	6.5	5.1	6.0
Lecturer	7.1	7.2	6.0	10.0
All ranks	6.6	6.9	6.0	5.8

The Malaysian education minister in Kuala Lumpur has said it will cover any additional fees incurred by government-sponsored students if Australia implements its planned 20-30 per cent increase in tuition fees. But concern is increasing over the large number of private students who may be left stranded.

Government-sponsored students account for only about 2,000 (28 per cent) of more than 7,000 Malaysians (mostly Chinese-Malaysians) studying in Australia, many of whom are financed by their families or private loan schemes.

Many are deeply concerned that they will be forced to abandon their studies midway through their courses after reports that the Australian government may operate a "pay up or get out policy", and deport foreign students who cannot pay the additional fees.

For OAP read Old Age Professor...

When should professors retire? If a bill now before Congress reaches the statute book the answer, as far as the United States is concerned, may be never.

The bill, introduced by Republican Senator John Heinz, sets out to abolish all mandatory retirement ages. At present professors in American retire at the age of 70 and tenure agreements on most campuses provide for employment until retirement.

If the cap is lifted, universities fear that their most senior positions will be held down indefinitely by ageing

faculty members unwilling to leave of their own accord.

There are already problems looming, caused by the "bulge" of faculty now in their 50s. It is estimated that during the period from 1990 to 1995, even if retirement stays at 70, there will be only about 100,000 academic positions to be filled nationally.

Senator Heinz, chairman of the Senate special committee on ageing, is being asked to give an exemption of at least 15 years to colleges and universities, so that they can make effective plans for introducing lifetime tenure. He is said to be considering

the plan, but is not enthusiastic about it. In some quarters, however, it is thought unlikely that the bill will be approved by Congress. Alfred Sumberg, associate executive director for the American Association of University Professors, thinks no such law will be passed "until unemployment rates fall to zero".

The AAUP feels that a lifting of the retirement cap might endanger the academic freedom of professors, because lifetime tenure would probably not be tolerated by some institutions and the whole concept of tenure would thus be threatened.



John Heinz: committee chair

Shake-up fails to satisfy

from Ed Brandon

KINGSTON

A restructuring of the University of the West Indies has so far failed to remove the atmosphere of insecurity which has bedevilled the institution throughout its existence.

In a recent speech Sir Philip Sherlock, a former vice chancellor, was highly critical of the emphases in the present restructuring. He condemned the preoccupation with administrative matters, while the development of courses, the upgrading of research, and the relationship of the UWI to the rest of Caribbean tertiary education were being ignored.

Sir Philip's comments can be seen against a backdrop of several years' uncertainty as to the most appropriate form of university reorganization. Until August 1984 the UWI was funded through a central University Grants Committee by 14 regional governments.

The university consists of three campuses, in Jamaica, Trinidad, and Barbados, together with an extramural department with representatives in 10 other territories.

While there had been occasional mutterings about going it alone, and a certain amount of resentment at the dominance of the Jamaican campus within the whole university, serious discussion about restructuring was sparked off by a strike of the academic staff in Jamaica in 1975.

An earlier inquiry, chaired by the present chancellor, Sir Arthur Lewis, had recommended that the monolithic and complex administrative

bureaucracy be opened up. In the wake of the 1975 strike, another extensive inquiry, issuing in the Demas report, was conducted to seek views on such a democratic transformation. But its report was shelved.

For internal political reasons, unrelated to any of the issues that had originally sparked these discussions of restructuring, the governments of Trinidad and then Jamaica began to interest themselves once again in a restructuring in the early 1980s.

Their rhetoric suggested a need for greater local control over campus decision-making, but it was also obvious that at least in Jamaica one of the major concerns was the spiralling cost of running the university, aggravated by the runaway inflation in oil-rich Trinidad and later by the spectacular devaluations of the Jamaican currency.

At the behest of the governments represented on the university council, a series of administrative and financial changes were pushed through, and eventually rubber-stamped by the senate.

The earlier formula for assessing government contributions has been changed, and now the governments in the campus territories are responsible for virtually all of the costs of their own campus, and for a fraction of the cost of the remaining "centre" establishments: research institutes, some parts of the faculty of education, the extramural department, as well as part of the administration.

Since last August the one central UGC has spawned three additional local campus UGCs, the one council

Summer jobs programme

Up to 95,000 Canadian students may thank the federal government this summer when they pick up their pay cheques. For it has set up a \$203 billion programme aimed at creating vacation jobs.

The "Challenge 85" programme, designed to provide career and learning-related work for high school, college and university students, according

to employment minister Flora MacDonald.

The government is also planning a series of workshops to give disadvantaged youths and potential school-leavers guidance on employment prospects and training in job search techniques and personal financial management.

So the greater financial insecurity has brought with it only a greater likelihood of arbitrary cuts. The hopes Sir Philip articulated for increased efficiency in the use of the Caribbean's research and educational facilities or the widespread hopes for a more open and accountable administration seem as far as ever from realization.

India plans an open university

from A. S. Abraham

BOMBAY

A bill to set up a national open university is being introduced in the current session of the Indian parliament, which ends later this month. The federal education minister, Mr. K. C. Pant, who announced the decision, said that a report on the project was nearing completion.

The move is part of a general revamping of education in all sectors promised by Mr. Rajiv Gandhi's government. The present education policy, formulated as long ago as 1968, is being revised. The proposed revision will be circulated to the provincial governments and only after internal discussions with them will formal proposals be published.

The recommendations of the teachers' commissions, as well as set out in the 1964-66 report of the comprehensive education commission, will also be taken into account.

However, Mr. Pant has emphasized that the new policy will serve the same long-term objectives as the 1968 one. These include stimulating the study of science and technology, linking education and work, strengthening regional cohesion, and promoting equality and equity as everyday concepts.

The new policy, like the present one, will seek to attain universal elementary education, set up a national formal stream, promote adult and vocational education, and create "model schools" for other schools to emulate. Population education will be integrated into school syllabi.

As part of the emphasis on universalizing elementary education, the government has already offered in the last budget quite generous financial assistance to states for the education of girls. The new policy will break with the past by placing emphasis on rural implementation, for which federal funds will be more readily available.

Australia's policy on the education of overseas students in its schools and higher education institutions remains a shambles. Despite two government inquiries into the issue and despite last month's announcement of new arrangements by the Minister for Education, Senator Susan Ryan, including higher fees for overseas students, the policy still appears to be ambiguous, politically inept and contrary to principles of equity.

None of the interest groups affected by the latest changes - including the students themselves and the major providers, Malaysia - is happy with what has happened. The government has missed an opportunity to bring justice and rationality into a politically significant area affecting not only thousands of alien students but also Australia's relations with many of its near neighbours.

At present there are some 20,000 overseas students in Australia. A quarter of them are in secondary schools and the remainder are in universities and (to a much less extent) colleges of advanced education.

The vast majority of private or self-financed foreign students in Australian higher education - some 3,500 are sponsored - are from Asian countries. Almost 60 per cent of the total are from Malaysia and the great majority of these are of Chinese origin who are in Australia as a result of Malaysia's *Bumiputera* policy, or positive discrimination in favour of Malays seeking higher education places in Malaysia.

In the latter half of the 1970s there was virtually unrestrained growth in the number of foreign students admitted to Australia. Although a visa charge was first applied in 1980, numbers continued to expand so that between 1976 and 1983, for example, there was a fourfold increase in those attending secondary schools and a doubling of those in higher education.

The application of the visa charge was initially introduced to curtail the growth in student numbers and to make the subsidy Australian taxpayers were providing to foreign students and their governments.

The latest announcement highlights this and does nothing to resolve disputes about how well-off foreign students are nor the extent to which Australian taxpayers are subsidising their presence. Under the new arrangements, the fees paid by overseas students will rise from 25 per cent of the cost of tertiary place this year to 35 per cent in 1986 and 45 per cent the year after. This means that students taking courses in medicine, veterinary science and dentistry will pay Aus\$4,340 a year in 1986 (Aus\$3,100 this year) while others with pay Aus\$3,500 (Aus\$2,500 in 1985).

As well as imposing higher charges, the government has set a ceiling on the total number of overseas students it will allow. It has also set limits on the enrolment of foreign students in any tertiary institution, so that no more than 10 per cent of students should be from overseas as well as a quota of 20 per cent in any one course.

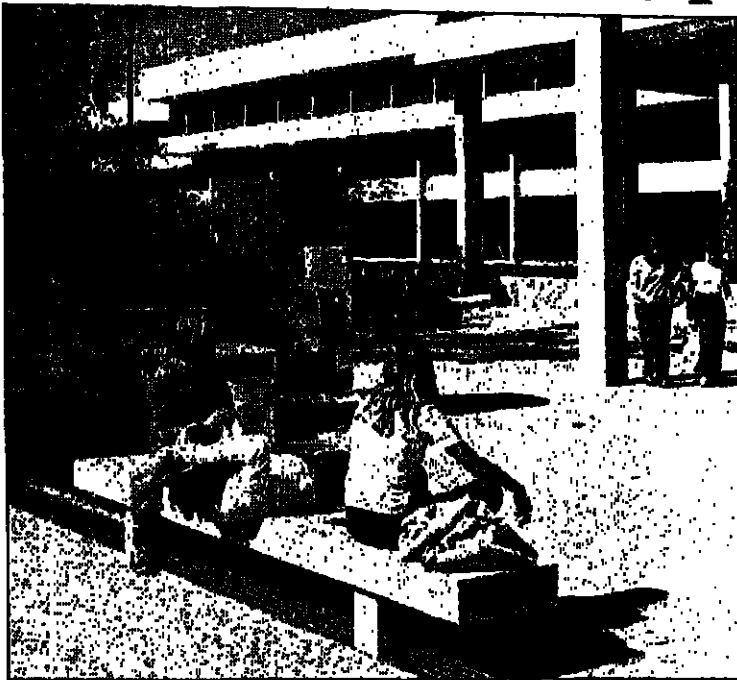
Given that foreign students are concentrated in very few universities and courses - they make up 36 per cent of Monash University's undergraduate engineering students and some 90 per cent of that university's civil engineering postgraduate students, for example - the implications of the new quotas for these institutions and some of their departments will be severe.

According to Professor Helen Hughes, director of the Development Studies Centre at the Australian National University, "Defying all equity principles, lower income Australian taxpayers are at the margin making it possible for relatively wealthy foreign families to educate their children at low cost in Australia".

Professor Hughes says it is clear that significant numbers of Chinese families and communities can afford the expense of educating their children in Australia while the demand for Australian education in Hong Kong and Singapore is probably largely income related.

She argues that foreign students should be required to pay the full cost of their education so that the present Aus\$100 million a year subsidy provided by the Australian taxpayer (her estimate) could be available to fund foreign students in a way that would meet national policies. The Aus\$100 million a year would fund about 6,500

A policy of undiplomacy



Australia's new rules on overseas students please no one. Geoff Maslen reports

Universities such as Griffith in Brisbane should consider a 'four-quarter' system, says Professor Hughes

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American education is becoming an expensive business

Money, money, money. It's a rich and varied world on the campuses of America. While inflation in the United States remains relatively low (an average of 4.7 per cent from September 1983 to January 1985) the cost of going to a higher education and the rewards for those who give it have risen for better.

This year the tuition fees at state-supported universities have risen on average by 10 per cent for undergraduates within the state, and by 13.9 per cent for those from outside. Private universities, where the fees are frequently three times as high, have kept pace. At a typical state university a year course, including room and board, will now cost a student and his parents around \$19,000. At Harvard it would be \$32,000.

Hence the continued outcry against President Reagan's proposal to slash \$4 billion from student aid programmes next year. The bulk of students do get some form of aid (at Harvard the average is 30 per cent, and the average at many will have to switch from grants to state institutions, or forgo higher education altogether).

There has been no suggestion from any quarter so far that the students' attitude should be shared by the faculty and administrators of universities. They have been doing rather well. Paying increases above the rate of inflation for four years in a row, they admittedly have had a lean time in the 1970s. This year faculty salaries rose by 6.6 per cent, giving the average professor at a public university \$39,640 a year, and his colleague at a private institution \$44,130.

Administrators within the system, who enjoy no fewer than 90 different titles, have mostly nestled by cost increases this year. With deans of faculties topping the list at an average of \$39,953 up from \$38,000 in 1980.

Against this background, it is hardly surprising that the need to raise money for the system goes high on the list of priorities at the "average" professor. Some would say too high. A professor at a Maryland state university in America, for example, is looking for support from industry may be changing their curricula to get it.

The report by the Franklin Research and Development Corporation, warns: "The extent to which corporate

Teaching becomes a sideline



President Reagan: wants to slash aid programme

of students come a long way behind fund raising. That's what the faculty spend most of their time on. We're not giving these kids a university education - this is just a school. Higher education doesn't start until graduate level over here."

At Williams College, Massachusetts, where Professor Francis Oakley has just been elected as the first English-born president, I was told by a senior member of the faculty: "Francis Oakley is a splendid chap, but we had a very strong short-list of 20. What swung the vote in his favour was the fact that he is such an able fund-raiser."

This constant search for money, judged essential for survival, has its dangers. According to a new report published by a Boston investment advisory firm, colleges and universities looking for support from industry may be changing their curricula to get it.

The report by the Franklin Research and Development Corporation, warns: "The extent to which corporate

donations have strings attached to their gifts may actually limit the diversity of thought on college campuses. For many universities and colleges, selling their programmes to corporations and other philanthropic agencies and individuals is key to economic viability. But the desire to create greater corporate interest can change a school's policies and practices."

"Corporations are increasingly realising that whoever holds a piece of a university has an edge on the marketplace. Through corporate giving, they seek greater control over universities and other educational institutions in order to access the best minds and technology for their own corporate goals."

But not all universities are simply holding out the begging bowl. Some have gone into business on their own account, and some of their efforts seem to bear little relation to higher education.

Park College, a small private institution founded in 1875 by the reorganized Latter Day Saints at Kansas City, Missouri, is mining limestone on campus property. Millsaps College at Jackson, Mississippi, runs a motel - while the University of Utah has an interest in 12 bio-medical companies.

One of the trend-setters is tiny Arkansas College, which has only 432 full-time students. Arkansas College has set up its own investment company, known as the Aberdeen Development Corporation, which is part-owner of a large food store and is currently negotiating the construction of a hydro-electric power plant and a shopping mall. It is making a healthy profit for the college coffers.

Chief business officers on campus, responsible for this sort of operation, are now being paid an average of \$45,990 a year which is a fair reflection of the esteem in which they are held. For with federal support under threat, a declining number of students emerging from the high schools, and increased competition for donations, something has to be done to keep the expensive wheels of American higher education turning.

Most experts predict, however, that in spite of their financial preoccupations, universities in the United States will continue to teach. If only as a sideline.

William Norris



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Olga Wojtas looks at Edinburgh University's growing contribution to North American studies

Scots view the Canadian scene

Earlier this month, John Turner, leader of Canada's opposition since the Conservatives won their unexpected victory last September, met 10 Edinburgh University students in Ottawa.

He chatted for several minutes, giving a light introduction to Canadian politics, then asked if there were any questions.

"Why did you make all these patronage appointments?" demanded one student; this was followed by a searching interrogation on his party's landslide defeat, and relations with his predecessor, the enigmatic Pierre Trudeau.

"He was visibly shaken," says one of the party. "He thought we'd just come to have a look at him."

However, Mr Turner was duly judged to be frank, charismatic, and, according to one female student, the possessor of "beautiful blue eyes, like Paul Newman's".

The students, taking degrees in business studies, geography, archaeology, English and history, but also attending courses in Edinburgh's unique Centre of Canadian Studies, were the first participants in "Experience Canada," a three-week study tour of the country.

The trip, sponsored by the Canadian high technology firm Northern Telecom, included a stay in a log cabin with neither electricity nor running water, living on campus at Trent University, Ontario, visits to Montreal and Toronto, and briefings with senior politicians, civil servants and some journalists.

The Centre of Canadian Studies was established at Edinburgh 10 years ago, and is funded jointly by the university and the Foundation for Canadian Studies in the UK, a body supported by the government of Canada and several of the provinces, as well as business.

Dr Martin says the programme is a "trip of a lifetime" and that it is the first time that a group of students has been able to see the country as a whole.

Previously, the centre offered a Canadian geography course, a Canadian history course, and a course based on the interests of visiting Canadian professors, who have included the distinguished sociologist S. D. Clark, literary scholar Douglas G. Lochhead, and urban geographer John Marshall. Dr Martin feels that the courses

were always implicitly multidisciplinary, but they are now being recon-structed to make this emphasis more overt. The geography course is now a combined historical and geographical attempt to explain how and why Canada exists as a country. Dr Martin, a historian, argues that Canadian history cannot be taught without an explanation of its geography.

This session, the former history course was launched in its new multidisciplinary form, involving lecturers from sociology, economic and social history and education, as well as Dr Martin and historical geographer Mr Stephen Hornsby, the centre's other full-time academic staff member.

The new course focuses on understanding contemporary Canada, with the various contribution linked by the common theme of the contrast between structure and perception. Canada is a highly structured country, in everything from its form of government to the mathematical outlines of its cities and farms, says Dr Martin, but the perceptions of these structures vary according to class and ethnic background, and which part of Canada they are seen from.

Dr Martin admits that the experiment has been disappointing in that student numbers have dropped noticeably. But he is not unduly alarmed, maintaining that courses in transition are an unknown quantity, and that at present they have weakened their identification with mainstream labels without yet having established a reputation of their own.

Neither is he concerned that virtually no students take the Canadian studies degree.

"I'm perfectly happy to see the courses primarily offered to students in conjunction with something else. There's little point in a multidisciplinary course if you want to put it on a pedestal by itself."

He firmly believes in multidisciplinary education, while stressing that this depends on strong single disciplines. "We regard what we are trying to do as having an importance far beyond the study of Canada, and being something of a flagship of where higher education should be going."

Dr Martin, an Englishman, also believes that such an approach has been easier within a Scottish rather than an English university, with its traditional broad-based degrees. "In a



Experiencing Canada: Edinburgh students with (back) Dr Ged Martin, their director and (centre) Mr Roy Cottler of Northern Telecom, sponsors of the three-week study tour

sense, what we are doing is putting an existing pattern into a new focus."

Another asset is the Scots' appreciation of Canada, not merely through family links. "Canada has a relatively small population, and south of the border is another country, loud, confident, not particularly sensitive, grabbing the best that's going, with its eye on Canadian natural resources."

Quite a lot of Scottish students nod very slowly and say, "We know about that," says Dr Martin.

"Canadian governments over the past 15 years have seen the importance of pointing out to the world that they are not Americans. That is the basis of

the Canadian image - they start from what they are not, and then begin searching for a national identity."

"Quite a number of Canadians argue that a country does not have an image until it has a mirror to look in, and it is in their interests that other people should say Canadians are X or Y."

A general perception of Canada is that it is not exciting, a view which Dr Martin completely denies. He has a fund of "not many people know that" stories about the country: the oldest international cricket series, for example, is between Canada and the USA.

Another tale involves the Dabbers, a Russian sect who emigrated to Canada at the beginning of the century. They staged a protest by walking naked down main streets.

"Most police would have been charged them. The Mounties then, itching powder on them."

The Edinburgh centre is unusual only for its multidisciplinary approach, but also in its emphasis on personal expression. Dr Martin devotes time to discussing students' lapses in spelling and grammar, and decorates the margins of essays with sketches of clichés such as "escalating crisis" and "vicious circles".

The centre's unofficial motto is "We have ways of making you talk," a small challenge given Scottish students' notorious reticence.

"If we can't put together courses which help people develop their personalities, then university is no more than a passage ride ending with a piece of paper," says Dr Martin.

The "Experience Canada" trip was a major success from this point of view, with the students gaining dramatically in self-confidence as a result of it.

The programme will continue for at least five years, and the government of Alberta has just given additional funding enabling next year's students to go to western Canada.

Dr Martin also attracted some £34,000 last autumn from Northern Telecom for the first university transatlantic satellite seminar, linking Edinburgh and Carleton University in Ottawa.

Canadian government support has enabled the centre to set up a series of seminars in which British schools pursuing Canadian research projects sometimes isolated within their own institutions, where few colleagues share their enthusiasm - can come to Edinburgh to discuss their work.

This month, the centre also hosted the 10th anniversary conference of the British Association for Canadian Studies, attended by 200 delegates, including former Edinburgh student Walter Maclean, now a secretary of state in Brian Mulroney's cabinet.

It is of prime importance to establish the centre's undergraduate teaching on an integrated basis that to work into honours or postgraduate work, Dr Martin says.

But he is certain that within three years, people associated with the centre will be making a major intellectual contribution to Canadian studies.

"A multidisciplinary centre is not entitled to hide behind its provincial trendiness. It ultimately has to produce the kind of research that will change the way we work and what we produce. You can't allow the novelty of experiment to cut across that."

Taking class out of the classroom

David Jobbins looks at efforts in Barking to bring more children into higher education

Britain's consistent failure to attract students from working-class backgrounds to its universities and polytechnics is perhaps the greatest blemish on its higher education system.

Even the combination of national student awards and a brave attempt at social engineering through the reorganization of secondary education has failed over the years to make any significant dent in the low take-up of places by the children of manual workers, and the corresponding preponderance of middle-class students.

Progressive educationalists, pressure groups and trade unions have all pointed to the need to correct the imbalance, but none have yet proposed a solution to the chronic indifference to remaining in full time education after 16 shown by working class children.

Ministers too, have expressed their concern in the context of student financial support, arguing that the present system of awards has not succeeded in removing the perceived barriers to higher education and opening up the colleges to a wider social mix.

The latest available figures for new student awards, taken up in 1982/83, show a predictable pattern of significantly higher participation in the south, and in the counties and outer metropolitan authorities.

The other side of the coin is a lower participation rate in the north and in the inner cities.

The division is, according to the Department of Education and Science, based less on crude geographical pattern than between more and less prosperous areas.

Barking's participation blackspot has to square with this accepted fact. The first London borough of Barking, which was part of Essex until local government reorganization, is by far the lowest according to the DES figures for student awards.

In 1982/83 171 Barking residents took up awards for the first time, a rate of just 75 per 1,000 of the 18 and 19 year-old age group.

This compares with a rate of 220 per 1,000 for Greater London as a whole, 204 for the metropolitan districts, 214 for the non-metropolitan counties and 202 for England and Wales as a whole.

The rate is half that of the lowest non-metropolitan county, making it one of only three of the 104 authorities in England and Wales with rates of less than 100 per 1,000. The others are Staffordshire in the West Midlands (94) and Knowsley on Merseyside (96). It also compares unfavourably with the immediate neighbouring borough of Newham, which has a rate of 115 per 1,000.

Low participation rates are not unexpected in inner city areas. Social deprivation, unemployment, often the presence of ethnic minorities with no tradition of post-school education, and a consistently tighter staffing in the polytechnics and even a lower cost, measured against salaries. Although some technical aspects of the survey do not equate with NAB figures, especially where part-time students are concerned, the DES insists that the figures make valid comparisons with the target student ratios adopted by the NAB.

According to the survey, although the colleges and the polytechnics worsened their ratios in the last year for which figures were available, only the polytechnics had actually exceeded the target, with the colleges lagging behind.

By mid-summer, the NAB will have its own monitoring information to substantiate the DES monitoring figures. In the meantime, however, the DES insists that the figures make valid comparisons with the target student ratios adopted by the NAB.

Given the sensitivity of the issue and the level of opposition bound to be encountered by the new proposal, the odds seem stacked against substantive change being introduced for 1988/89. Although the pool distribution does not have to be completed until the end of the year, it is already late to begin recasting the system.

Some will argue that, although the NAB's guaranteed stability referred to student numbers, institutions had a right to expect rough and ready figures to be made available. However, it will be almost surprising if the 1987/88 plan is not accompanied by a radically new funding system.

tradition one is having to struggle hard to overcome."

The borough is in the throes of considering secondary school reorganization in the light of falling rolls with proposals soon to emerge for the establishment of a tertiary college. This is likely to provoke a renewed confrontation with the borough's teachers, who nevertheless acknowledge that something has to be done to encourage more children to stay on at school.

Barking's National Union of Teachers is considering its response to the authority's proposals but Mr Ken Jones, a member of the NUT's national executive who teaches at the borough's Barking Abbey school says: "We are not sure that the problem can be dealt with simply by a reorganization at post-16 level."

The NUT believes that initiatives are needed in the 11 to 16 curriculum to engage children's interest and weld together a practical introduction to the world of work with a fuller academic approach.

Mr Jones is cautious about appearing to criticize or dismiss school students who do leave at the first opportunity. "Teachers respect the fact that students are choosing a particular option at 16 which is often work-related. It would be academic snobbery to look down on students for exercising this option."

"The problem we face now with youth unemployment is how do you convince students who are used to a particular educational pattern: that there is value in staying on. People in the past may have left and found a number of useful things to do, but now they will be at a disadvantage in the job market."

Headteachers have found that in past years exhorting children to stay on has frequently been counter-productive. The determining factor over the years has been the size of the sixth form. Although before 1970 a number of students came from outside the area, sixth forms tended to be bigger when selection was still a factor.

A Mayesbrook in Dagenham the sixth form numbered about 120 in the years that the final selective intake was working its way through, of whom up to 30 would go on to higher education. With the phasing out of the selective element, the sixth form began to consider large random fluctuations falling as low as 45 but never exceeding 90.

In a peak year a dozen go into higher education, falling to five or six in one of the leaner periods. Somewhat surprisingly, the balance is tipped slightly in favour of the universities, with a tiny proportion entering Oxbridge - approximately 10 over the past decade.

Headteacher Mr Anthony Ranzetta says: "There is a tremendous job needed to convince the youngsters - and their parents. Parents simply tell their children it is their choice. The natural instinct of our youngsters is to choose to leave school, not because they are unhappy but because they want a change."

Teachers detect a strictly utilitarian approach among the youngsters to remaining at school. Undoubtedly this is shared also by their parents. Few of whom will have experienced post school education.

A round table discussion with local trade unions elicited the view that staying on was only worthwhile if there was a guarantee of a job at the end of the day.

North East London Polytechnic lecturer Mr Phil Bradbury believes there is a genuine concern on the part not only of Barking but of Newham education authority over the low participation rate. "It has always been difficult to know what to do," he adds.

Initiatives have taken place to remedy the situation in part. In the early 1970s a link was established between NELP and East Ham College of Technology, which offered a foundation course for 16 to 18-year-olds to enable them to tackle higher education via an alternative route to the traditional GCSEs.

Mr Bradbury admits the initiative was not as successful as its early promise. Some people from the course failed to find places at NELP, there was some lack of enthusiasm within the schools who were anxious not to lose potential sixth-formers, and publicity was inadequate.

But it paved the way for access courses to NELP now being run both at East Ham and West Ham colleges. Designed for mature "second chance" students these have proved more successful.

West Ham's in particular is geared directly to NELP's own school for independent study, and offers a path for mature students into a DipHE course and thence in many cases to degree level studies.

NELP has now accepted two intakes of some 12 students each from West Ham after an initial pilot year. East Ham college too has established a community consultative committee in parallel with others directed at industry to foster the assimilation of mature students into post-school education.

Mr Bradbury, who is admissions tutor for NELP's school by independent study, says: "Within the borough there is an enormous pool of people with the ability to benefit from higher education which we have barely begun to tap. We are now building a system which will enable people to come into higher education which was not there."

He believes that the experience is creating a new expectation in the community, with the opportunities advertised by word of mouth.

An annual intake of about 200 to the DipHE course, mainly from the local communities who lack a tradition of post-school education, could be a way of bridging the culture gap.

Newham's proportion in higher education outside the universities is small in comparison with some other authorities at 38, but compared with its university rate of a mere 27 per 1,000 it is large and growing.

It remains clear though that effective action is needed at school level, at parents, as well as youngsters, the only way of changing deeply ingrained attitudes.

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Ivy Compton-Burnett and Dame Edith Sitwell

Life and work - is it gossip or art?

Ever heard why Michael Holroyd never became a biographer? Or how Susan Crossland turned down the chance to write a life of Margaret Thatcher? Or Harold Macmillan's as yet unpublished revelations to his biographer in his garden?

And if you knew, would it be gossip - or art? Would it be any different if you had never heard of these people? And what if I was making the whole thing up?

The conference was real enough: modern biography at the University of East Anglia. The *crème de la crème* of British biographers, inveterate storytellers all, mulling over the nature of their work.

The stories they tell have changed in the last century, argued Professor Robert Skidelsky, professor of international studies at Warwick University and biographer of Sir Oswald Mosley and John Maynard Keynes.

Victorians wrote panegyric: records of the deeds of great men (almost inevitably men), often commissioned by their families, and decorously silent on their domestic lives. Then came Freud, and Lytton Strachey, whose biographies of eminent Victorians interpreted their public achievements in the light of their private lives.

Before modern biography which, suggested Skidelsky, is interested in the life and sometimes not in the work at all. Bloomsbury biographies for example. "The sexual and emotional events have become the chief subjects of a wide range of biographies, not because they illuminate achievements but because they have taken the place of achievement as the justification for life, and therefore biography," he argued. "You can't blame biographies. It reflects a shift in sensibilities. It reflects our age. The kinds of answers we tend to give to the question 'What is important about life?'"

If great deeds do not count, then neither do great men. Anyone, it was agreed, could become the subject of biography. So how do biographers choose? "It's a challenge, a puzzle," said Victoria Glendinning, biographer of among others Edith Sitwell and Vita Sackville-West. A kind of detective story, suggested Andrew Sinclair, describing how he deduced the cause of Jack London's death through "total immersion" in the man's life, mind and papers for over a year.

It has to be "a good story," said Susan Crossland, author of many *Sunday Times* profiles and a life of her late husband, politician Anthony Crossland. She was invited subsequently to write a life of Margaret Thatcher, and turned it down. "I decided there wasn't a story," she said. "Here was a phenomenon, but there wasn't a psychological drama. I felt when you took Margaret Thatcher's Russian doll's top off, there would be another Russian doll inside. So I said 'No'."

Michael Holroyd, whose family wanted him to be a scientist but who wrote lives of Lytton Strachey and Augustus John instead said: "I took up biography so I could enter other people's lives where, quite frankly, there seemed to be more going on. Amateur biographers. 'The half-

dead writing about the dead" according to Skidelsky - probably felt the same. Biography is still the province of the amateur: it is not studied, it has no theory. It has moved away from history - which becomes ever more austere as biography becomes more capacious, suggested one speaker - and from literature, where structuralist theories deny a relationship between author and work and therefore any relevance for literary biography - at all.

Yet literary biography expanding: the art of biography was threatened with a split between books about writers and books about other people, suggested Hugh Brogan of Essex University and biographer of "Svalovs and Amazons" author Arthur Ransome. "There's a moment for a very strong 'up' in literary biography," suggested Malcolm Bradbury: "because all this French critical stuff is going down."

Biography resembles fiction: "My aim would be to write a book with the tension of a novel but putting down nothing that could not be backed up by fact, and leaving out nothing necessary, however difficult it is to fit into the scheme," said Victoria Glendinning.

Biography is reconstruction, said Hilary Spurling, biographer of Ivy Compton-Burnett. The difficulty is reconstructing from multiple truths. Nobody's accounts - letters, diaries, interviews from the subject, friends or relations - could be taken at face value.

People held back or even destroyed evidence: "official" biographies were restricted; archives forbade access; tape-recorders deceived; biographers were bound by ethics. Labour party deputy leader Roy Hattersley had a point, admitted Susan Crossland, when, after seeing accounts of his conversations in her book, he complained he could no longer even talk over dinner without someone writing it down.

"What do you do?" asked Andrew Sinclair, biographer of film-maker John Ford. "When the subject himself is a chronic liar who never got his date of birth right, nor his Christian name, nor his surname, and he himself admitted he never spoke a word of truth to any interviewer?"

Consistency, perhaps even more than salaciousness, is what readers apparently want. Readers like to make up their minds about the motives and morals of the life they are reading about, it was argued. Deconstructing biographies could deter readers, but others could introduce writing otherwise neglected. The life of Ivy Compton-Burnett was conscious propaganda to get people to read her novels again, said Spurling.

So did anyone have the right to insist that no biography was written about them, insisting as W. H. Auden did that biographers were "gossip writers and voyeurs, calling themselves scholars"? They could destroy evidence, the biographers agreed, but that would just lead to bad biographies. But they couldn't forbid a biography being written. They were dead. They had no rights. That was that.

Karen Gold

John O'Leary examines the latest row brewing over the advance further education funding pool

Cutting a slice through the three-tiered funding cake

This year was to have been the calm before the storm for public sector higher education. The National Advisory Body had decided on a period of stability in preparation for next year's exhaustive planning exercise. And, while the Government's sharply increased requirements for teacher training places will mean some unwelcome adjustments to the principle still stands.

Now, however, chaos has been declared again. In the annual assault on the advanced further education pool, Mr Christopher Ball, chairman of the NAB, board, has said publicly that similar work should be funded equally regardless of where it takes place and a working group is already hard at work trying to bring that about. The result may well be a protracted battle between the vested interests of the polytechnics with those of the colleges, as yet another new funding system takes shape.

Almost unbelievably, the funding system for public sector higher education has altered in some respect every year since the pool was "capped" in 1980. And the fact that last year's allocation passed with little of the future which has provided some previous attempts proved to be no guarantee that it would be tried again. Indeed, perhaps the central point of the system which has evolved in the last two years - the different treatment of polytechnics, major and minor colleges - now seems doomed.

Even if, as seems highly likely, wholesale change cannot be introduced in time to effect the 1988/89 pool, Mr Ball's remarks make it clear that the tide is east. The public sector cannot argue credibly against differential funding across the binary line while still perpetuating unequal practices between its own institutions. Once such an argument has been admitted by the senior figure in the NAB, it becomes almost impossible to continue with three tiers of funding.

In fact, the question of "categorization" - deciding whether the polytechnics should retain their privileged status, whether some colleges should join them and how many that should be - was an issue which should have been addressed

last year. It was discussed within the NAB chairman's study group but proved too sensitive and the arguments too complex to be resolved in time for the 1985/86 allocation.

The debate had been, in effect, a condition of acceptance of the liberal system by college representatives on the NAB and there has been dissatisfaction at the delay in reaching conclusions.

This is hardly surprising since the colleges lost large amounts of money when the polytechnics were given a guaranteed share of the pool, despite showing that many of them incurred similar costs. Instead, all that happened last year on the issue was to include a number of additional colleges in the "major" category, thus diluting the advantage to those institutions which might have "escaped" to join the polytechnics' club.

The approach being examined by the NAB's technical and data group would be away with categorization entirely, as far as type of institution are concerned. There would remain significant differences in the rates at which various institutions are funded, but these would be determined by the type of work done.

Two attempts have been made so far to find a system which would provide a common unit of resource for teaching but give due credit for research. The first and crudest suggestion was simply to distribute a proportion of the pool directly in relation to the number of students on degree or postgraduate courses. This would act as a proxy for research activity on the assumption that research invariably takes place in departments engaged in degree level teaching.

Last week's meeting considered four further options, which were more sophisticated versions

of that approach. It had already been recognized that straightforward reliance on degree-level work would prove a severe disincentive to the NAB's avowed policy of encouraging sub-degree courses and the 20 per cent of the pool necessary to fund the new system properly was an unrealistically high figure to keep back.

Instead, 10 per cent of the pool was chosen as a possible figure to hold back to fund research and formulae "put forward" to distribute additional funds according to the

Anthony King analyses the importance of providing appropriately for overseas students

The current scramble for overseas students is the most recent evidence of Britain's dependence on the global economy. Like cars, educational courses are a commodity. In a world market, how many are sold depends on their price, their past and present performance and, in regard to content, their relevance and reliability for the country and conditions where they will be put into use.

The market, however, is imperfect, still biased in favour of English-speaking countries, including Britain which – despite huge fee increases for overseas students – still benefits from historic, political and cultural connections.

Two kinds of market exist; the first, largely but not entirely consisting of students from so-called "developing countries", many in the Commonwealth. This might be expected to decline over the next two decades as these countries increase their own facilities. The second market, currently being addressed, could – with the right kind of planning – grow considerably in the future. This is the market, long recognized by the London School of Economics and other institutions, which provides for all comers from every part of the world and which rests on their global reputation for knowledge.

Yet apart from this handful of known centres, how far is the British higher education system as a whole

Pupils of the global society

tooled up for this second market? How far do present courses, whether undergraduate or postgraduate, provide an appropriate education both for overseas students as well as those from home which explicitly recognizes the wide spectrum of countries from which students come? This is not just those from overseas (virtually everywhere in the free market world according to British Council data) but also from the growing proportion of the population born outside the UK but resident in Britain, whether Commonwealth or not.

In addition, however, how far do courses also recognize the global economy which influences economy and society in contemporary Britain? Or the increasing internationalization of professional activities (especially advanced producer services such as accountancy, real estate practice, engineering, architecture or education) where people now work all round the world? What implications does this globalization of everything have for research and education in Britain?

Over the last ten or fifteen years, the recognition that students from so-called developing countries required a different course content from that of

domestic students has led to special courses on "x" or "y" in developing countries. The result has been, by and large, to create two populations, the first, largely from overseas, for which explicit recognition is given to the "developmental" (ie economic and political), climatic, social and cultural context of professional activities, whether these are in education, civil engineering, health administration or architecture, and the home-based one where much, if not all, of this "context" is often taken for granted. The result, in many cases, has been to create a gap of conceptual understanding between the two.

If this gap has been closed in recent years it has largely occurred in courses dealing with "development" and probably, more often in relation to overseas rather than domestic students. The two populations have been integrated

by recognizing the existence of a single world system in which the world economy is one of several influences affecting local populations: in a global system of production, the squatter settlements, banks and multinationals are all part of the same process. Yet there are other influences: the political complexion of the state (the socialist or market oriented government providing the working context for doctors, teachers or engineers) as well as the local social organization and culture. Whether students come from home or overseas, and whether they study science, technology or the arts, these influences are common to all.

There is, in short, a need to re-examine the paradigms and assumptions with which courses, institutes and research agenda have been established over the last decade (or at least, before the cuts).



President Mitterrand and Mrs Thatcher: looking for closer links

motivation to meet the exchange with people from different cultures. Working on attitude change is a more difficult process than working on what is traditionally called learning, ie the cognitive. Means of attaining such objectives are contact with the exposure to other cultures, through intercultural parties, discussion groups, films, theatre, art, music and so on. Often prejudice is the result of "not being familiar with". However, research shows that, though contact usually reduces prejudices, in some cases it increases it. For contact to have a positive influence, it is generally necessary that intercultural exposure be facilitated by elucidation and guidance. Moreover, contact situations must be pleasurable. Thus the connotations that come to mind relative to the experience of contact with other cultures and people are positive and more likely to be sought after.

● **Socio-cultural skills** imply learning to function effectively within different socio-cultural patterns. The values you refer to, your tone of voice, your gestures are all culture specific. Being unaware of, or ineffective in your use of these and other "socio-cultural" messages will seriously affect your results. The successful outcome of an international negotiation or the trouble-free management of a multinational team are critically dependent upon proficiency in such skills.

Cultural differences reveal themselves in the way people organize their thoughts. Thought patterns and processes do not coincide across cultures and may, at times, conflict. When lectures and seminars within a regular curriculum are taught in another language by visiting instructors, students become aware of this "cultural gap" and acquire the mental ability to operate in different cultural settings.

● **The fourth component** of an international training programme is the integrative component or field experience. It implies developing the capacity of adapting to a new environment, of intellectual and attitudinal flexibility. The means to achieve such integration

is obviously time abroad. However, if the experience is to have a positive effect, it must be well-prepared and realistic.

Many existing programmes in international training in both engineering or business schools concentrate on the cognitive component (international law, history and institutions, languages). Many have exchange programmes or training periods abroad, however there is very little preparation and follow-up of the "cultural" kind. Moreover, the affective and socio-cultural elements are neglected. Since "cognitive" knowledge does not suffice to change attitudes and behaviours, we have to stress here the importance of the affective and socio-cultural elements.

On the basis of the experience gained in a few institutions practising the sort of international training advocated here (The Centre for International Briefing, at Farnham Castle in Britain, the Ecole Nationale des Ponts et Chaussées in France), the moment is ripe for organizing a new model higher education institution on a network basis: engineering or science and technology departments from various European universities would agree on a common curriculum, rotate their students and teachers to ensure exposure to two other languages and cultures and confer a common degree.

Science and engineering graduates of such a network would be fully equipped to live and work in multinational labs or firms operating in different environments, and could expect far better career prospects than their single-language, single-culture colleagues.

Edmond Lisle was a director of social sciences within the French Centre National de la Recherche Scientifique and is currently in charge of the Economic and Social Research Council and CNRS collaborative programme in social sciences.

Celia Russo is head of the department for international, cultural and language training at the Ecole Nationale des Ponts et Chaussées and chairperson of the working group for international exchanges of the European Society for Engineering Training.

A similar conceptual split occurs in research funding. In a well argued article in *The Times* (September 21, 1984), Alan Gilbert discussed various reasons for Britain's declining commitment to overseas research, one of which he saw as "the increasingly insular attitude in this country". What was not questioned, however, was the basic assumption that research proposals can and should be classified into either "home based" projects, only concerned with the UK, and others concerned with "overseas".

Last year, a further 296 foreign-owned companies decided to locate in the UK, an increase of 36 per cent on 1983. With multinational companies responsible for 40 per cent of world trade, jobs being exported to low wage countries abroad and a world wide system of communications and cultural developments in Britain makes nonsense unless set within a larger global context. And when postgraduate courses depend for their existence on overseas students, in what other framework can the demand for and supply of education be understood? Despite this, however, many research initiatives (not least in the Economic and Social Research Council) assume that the boundaries of a problem are somehow defined by the nation's shoreline.

It is generally acknowledged that economic restructuring means a shift to services and a knowledge-based economy, and one that competes on a worldwide scale. Yet what kind of knowledge will this be and for whom will it be produced? What is tomorrow's information technology supposed to transmit? If capital and labour are transnational, so also must education and knowledge. While all courses will have a universal, or central core of knowledge, each will need to recognize the economic context of its application.

Whether in relation to research or the development of new courses, think where resources ought to be invested now. Yet in many ways, precisely the opposite is happening. Government policy and economic constraints are forcing social research into domestic UK projects; fundamental work of a broad, comparative nature is being neglected in favour of short term, often limited projects; overseas research is in decline and area studies, as J. D. Fage describes (*THE Times*, March 23, 1985) are shrinking. Overseas students, the principal contact with the outside world, obliging education to rethink their paradigms, are being priced out of the system and turn elsewhere, to build up relationships with our competitors.

Over the last few years, between 15,000 and 20,000 overseas students have, in any one year, been in various higher education institutions in London. In each of the declining industrial conurbations in the West Midlands, West Yorkshire, the North East and North West, between 3,000 and 5,000 more have been contributing to the replacement of an outmoded industrial sector by stimulating the demand for education in services and simultaneously building up links with the outside world. They have, in the process, been establishing what will become the standard pattern in the 20th century.

If, in the next 20 years, universities are to be equipped to deal, whether at home with overseas (as well as domestic) students, or abroad, with incoming graduates (of whatever national origin) working for British companies, the wealth on which they depend, they will be based on an appreciation of the world economy, an awareness of local resources and a sensitivity to local social and cultural needs.

As the Middle East boom fades away, some companies are now looking at markets in China; and the Algerian and Saudi Arabian governments are sending students to Britain. Yet how far are universities and their products equipped to deal, whether in language or country-specific knowledge, with the Chinese, Algerians and Saudis? Or, for that matter, with Mexico, Egypt or Brazil? More cogently, will the resources be made available for them to do so? To return to the analogy made at the start, the retooling process should be undertaken right now.

The author is senior associate research fellow at Brunel University and the development planning unit, University College, London.

Sexual politics and political science

It is a major paradox that political science – which, above all disciplines, should be leading, not lagging – has been so slow to deal with questions about women's rights and roles. That this is so is doubly surprising in view of political scientists' explorations over the past two or three decades into more informal political processes. Into how issues are kept off political agendas and into more complex understanding of power relationships. The reason, ELIZABETH MEEHAN argues, may lie in our use of language and in the way we make disciplinary divisions in academic subjects; the solution may lie in a new relationship between methods of teaching and writing about women and actual forms of political organization and participation.

Although there is not always clear agreement about causes, sociologists of language share Wittgenstein's view that there is a close connection between language, social ideas and social action. Bernstein draws on this link between symbolic systems, social structures and the shaping of experience, changes in symbolic systems being governed by parental or class power. He argues that, although working class children may show more imagination, children of the middle class – the traditional disseminator of knowledge – show a tighter system of logical ordering, one which rules out knowledge communicated in imagination.

But even the formal gender court notations. There is a riddle which seems to be popular about a father driving with his son. Following an accident, both are taken to hospital where the surgeon brought in for the child exclaims: "I can't operate on that child. He is my son." People used not to be able to explain the riddle because an unconscious assumption that surgeons were men. Although such riddles may not produce the same effect today, even liberal men find objections to course-titles like "Man and Society" fairly ridiculous. Yet, even though the idea may be to explore generally held images of women as well as of general issues in economics, social order, rationality, altruism and so on, the implication seems to be that the allegedly universal characteristics are male, not female. Treatment of women is "special", lasting for a very few weeks, and thus by implication unimportant component of any such course.

This reflects a common belief that men make history. If the sociologists of language are correct, this belief exists because history is recorded as though men make history. This affects not just our "factual" knowledge but also our sense of what is "natural". According to Mill, what is natural is what is "customary".

In fact, the poverty of our inheritance lies not so much in either the natural or factual absence of "great women" in history but is the result of other factors. The reason seems analogous to Bernstein's explanation for the less of error in the middle class knowledge that middle class control of linguistic rules and conventions. Sometimes the reason seems to be another, if slightly different, case of his claim that the production and dissemination of knowledge is controlled by a dominant class. Recent revisions of history indicate that the thoughts, artistic talents and political action of women since the 14th century have been downgraded or forgotten as the result of reviews and biographies alleging plagiarism, personalization and perverted sexuality. Another technique that is identified is the editing out of significant arguments in special reissues of older works. Although these things appear to have happened most systematically in what is called "literature", it is important to note that it is often in "literary" works that women have theorized about female political and social roles.

Women's studies is like developmental studies in the sense that it also draws on several disciplines such as economics, sociology and psychology as well as literature. But there is a difference. Although the impetus for feminism comes from the radical strand of development studies, it does come from the inside; from established practitioners of the discipline who want to do a better job. Criticisms of research frameworks and language usually come, however, come less from those in a position to choose the outside or but still largely from the academic hierarchy. Political science could be like development studies in the way that it develops for responding to feminist challenges and in so doing to improve the discipline, are already there.

The difficulty lies not just in the general fact that "Aristotelian categorizations of knowledge do not correspond very directly with common experience" (of which women are particularly aware) but in the specific fact that Aristotle's distinction between the public and the private has been a powerful influence in thinking about what constitutes politics and, hence, political science. This has been compounded by a more recent disciplinary division of labour: separating political science from political economy and political philosophy. The first has led to an emphasis on state institutions as the proper units of analysis in political science, defining the private as personal and non-political. The second has discharged attention by political scientists (instead of economists and philosophers) from those areas in which the private could be construed as political.

The feminist view is that the personal is political; that household and sexual politics are part of the distributive process and just as political as issues of defence, transport or foreign policy.

Three tasks and three strands of change are already obvious: filling the historical blanks; filling gaps in current literature; accepting as legitimate so called women's issues as case study material in works on pressure groups, institutions and policy. So far as the first is concerned, the actual task is not obviously one for the political scientist. For our own writing, and for teaching we ought to avoid dismissing any valid attempt out of hand – or unread – as feminist propaganda.

The question of authorship is sometimes delicate. Just as members of the black power movement felt that white people, because of their different experience, could not write about racial discrimination, so some feminists think that men cannot write about women. The controversy parallels that between the positivists and the observer schools. For academic women, there is an added twist: the possibility of being accused of exploiting understandings reached in women's groups to succeed by men's standards in a men's world.

Whoever the author, it is important to avoid the "Women and the Syndrome". Women as an afterthought is not much of an advance on older works in which women are a footnote or even a paragraph. The study of women needs to be integrated with other bodies of knowledge in a way that both enriches the general texts and increases the literature on women.

The same points apply in course provision. Some universities already have undergraduate courses such as "Sex differences in society". And there are a few postgraduate women's studies programmes. The question of this approach is that it is not least likely that previously excluded topics



St. George and the Dragon (representing the thinking and achieving part of Woman... and thus a threat to the other image)

are on the agenda. But there are possible difficulties. "Ghettoization" of those who teach – and of students – is a risk; the very existence of women's studies courses may lead to a complacent view that there is no need to alter other courses; if there is no strong administrative "home" for the course, it is possible that contributing staff will treat it with lower priority than their own discipline's courses. Pressure on resources is producing strict rules about course proliferation at undergraduate level and increasing competition for less funds makes the prospect of new postgraduate programmes bleak.

Political science was one of the last social science areas to respond to the interest in women's roles triggered by 'second-wave' feminism.

Vicky Randall

In view of such problems, many academics try to allocate specific weeks and a couple of essay questions to women's rights and their role in society. There again the problem of "ghettoization" may counterweigh any advantage. The very percentages involved "tell" students that women are proportionately less important.

The best solution obviously is to develop a consciousness throughout courses that "women's issues" are relevant to "men's" and no less political in ideas about citizenship, electoral systems, participation, representation and substantive policy areas. This is the most likely and satisfactory way of conveying the view that women are as "normal" as men in their membership of the political community. It costs less, requiring no special appointments or programmes and would be uncontroversial in the sense that most academics are pretty free to teach what they like within the rubrics that flow to boards of studies and senates. However, if administratively easy and professionally sensible, this approach is likely to be ideologically difficult. It is hard for people to escape habitual ways of thinking about their discipline and about what are to be regarded as basic texts on their bibliographies. At Oxford in the late 1970s female *PPE* students had to go through catalogues and revise their own bibliographies. Academic controversies over writing and teaching about women are similar to disagreements about women's participation in public life. These are connected to competing theories about the sources of inequality between women and men and, as a result, what steps are needed to alter the distribution of power.

So far as academics are concerned, there is growing agreement that the systematic pursuit and communication of knowledge is not a neutral process.

There are politics in the "private" sphere, and those who inhabit the private sphere are also participants in the public. Policy directed at the private sphere is no less political or important than policies aimed at the public.

The author teaches politics at the University of Bath.

Oiling the wheels of the Franco-British tandem

Edmond Lisle and Celia Russo look at training for international science

In the autumn of 1981, at Chequers, Mrs Margaret Thatcher and President François Mitterrand decided to expand Franco-British scientific collaboration. A meeting of the heads of research councils and chief scientists from both countries in London, in February 1982, noted how much had been achieved since the Chequers summit, and made plans for further developments.

The reasons for closer scientific integration between the two countries are, first, the need to weather the economic crisis and adapt to the changing world order emerging from it. Secondly, to remodel our educational concepts and systems so that they can meet the requirements of industry and science in an international setting.

In the highly competitive changing world order, Britain and France are not without assets. Both are richly endowed in the field of science and contribute as much as 10 per cent each to the world's output of new knowledge in major scientific disciplines. As former imperial powers they have left their mark on, and maintain privileged links with, many of their former dependencies.

For all this, the two countries seem slow to adapt to the changing world order. The recent Scientific and Engineering Research Council report, *The Needs of Engineering*, stressed that the position of UK manufacturing industries had worsened since 1980. The 1981 balance of payments surplus of £5 billion in manufactured goods had become a deficit of £2.5 billion by 1983. "There is also a tendency for imports to be of more complex, higher value added goods than exports", France's position is similar with a positive trade balance in manufactures with developing countries, a negative one (in the higher value added products) with the advanced industrial world.

Part of the reason for poor export performance in high tech manufactures is the inadequate linkage in both countries between higher education and industry. The 1983 *Atkins Report*, *Improving Research Links between Higher Education and Industry* could equally well apply to France in its diagnosis and many of its prescriptions.

Another reason is the duplication of effort in both countries in the rest of the EC. All the largest and many of the smaller countries of the

EEC are trying to do too many of the same things. (*The Needs of Engineering*). The Esprit programme and the increased Franco-British collaboration in science and technology are ways of eliminating duplication and thin-spreading of resources. More such ventures are an obvious means of making Europe's science-based industries competitive with the American and Japanese.

Closer higher education-industry linkage and bi or multinational cooperation are necessary conditions. They are however insufficient. A third condition has to be met: to make British and French scientists, engineers and managers able to work together in joint undertakings, at home and abroad. This requires not only fluency in the partner's language and culture, but fluency also in third parties' languages and cultures.

An American reporter recently interviewed a Japanese businessman in Paris and asked him what international language he used. "My answer", he said, "is my customer's language". Today, the main headache of Britain and France have to overcome if they are to cooperate together more effectively and to promote closer European industrial integration, is their old reluctance to acquire other languages and cultures – a hangover of their former imperial status.

Conversely, Japanese commercial expansion is based on training, on a very large scale, Japanese scientists, engineers, technicians and managers, in foreign languages and cultures, to enable them to operate abroad efficiently.

Designing a curriculum for international careers implies, however, much more than focusing simply on the cognitive. International contacts are basically dependent upon interaction and communication, which, in turn, rest on attitudes.

Experience suggests that training for international careers should be the sum of four learning objectives. ● **Cognitive objectives** are the acquisition of specific information and know-how relevant to international reality: foreign languages obviously, but also subjects such as international law, history, economics etc. ● **Affective objectives** refer to attitude change or development. They imply the awareness of cultural differences and open-mindedness towards them; interest and



The Registrar, intent to win,
And get the next prospectus in,
Requires description of a course
In mini-paragraphs or morse,
And drafts today, if not before,
On one side only A4.
The future rents, of course, taken
care,
In answering the questionnaire
From NAB or DES
With nothing more than no or
yes
On how each working day is
spent
And how you view the firm-
ment.
The question merits half an inch
- The notes suggest that at a
pinch
Another eight might just be
found
But not a student, not a pound
Not anything that gives, of
course,
An extra unit of resource,
And copies please, not less than
three
For HMI and UGC.

(vi)

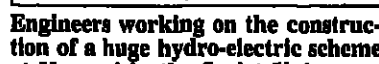
To write to order is to be
Captive but completely free
And so it seems not unabsurd
To jettison the counted word
And take the tyranny of rhyme
To meet such Supplementary
Times.
Not that they offer quite the
scope
That Auden understood, of
Pope
But just that in such little space
Artists have found it no disgrace
To fill a minute, fill a page,
Fill one act only on the stage.
A columnist might thus be
schooled
And contributions best be ruled
By width and inches which
define
Not word on word, but line by
line.

(vii)

And having done it, pay the price
And remember not to do it twice

Soviet engineers are more competent over a wider range than their British PhD counterparts, less highly regarded, and receive a thorough grounding in Marxism-Leninism. A. Kennaway and V. Lapidus explain the USSR's training programme.

and attitude towards the student may play an important part in grading. Failures are a reflection on the institute as well as the student.



Project work is given great importance, since it allows the student to apply information to solve real industrial problems. With each year, projects become more important and are frequently done in collaboration with industry. So despite the apparent narrowness of the specialized diploma

A. Kennaway is professor of mechanical engineering at Imperial College. V. Lapidus is an expert on the Soviet economy.

Learning that has come a long way



design projects, particularly those emanating from a top-down approach, the need for new knowledge on materials, devices, the environment etc. will readily become apparent – a process known as “systems-pull”. The procedure whereby this new knowledge is acquired is indistinguishable from the accepted scientific method. Thus the only difference between this form of “engineering” research and any other is that the results are of immediate relevance and applicability.

What then constitutes engineering research? It must obviously be research, gathering knowledge, on the methods and processes of the engineering activity, specifically the design process. The research will

methods of design, including problem-solving algorithms, design methods for particular artifacts, the development of computer-aided design methods including the techniques of artificial intelligence, etc., would all constitute engineering research. In this way our knowledge of design and the design process would be extended and enhanced; the methods used to obtain this new knowledge would of course be identical with those used in any other scientific investigation.

One of the chief benefits is

The author is professor of electronics at the University of East Anglia.

Yao Aduamah works in the Rural Press, University of Ghana.

... can also reach drop
outs from formal education, teach
farmers about agriculture, parent
about child health and co-operative
committees members about that

of these, unlike the commercial colleges, back written lessons with radio, television and student self-help groups. As non-profit trusts the

to establish and maintain contact with international organizations. Institutions such as the International Extension College, it is to be hoped

BOOKS

A safety valve for class conflict

by Paul Blyton

History and Heritage: the social origins of the British industrial relations system

by Alan Fox
Allen & Unwin, £30.00
ISBN 004 3310990

Given a predilection among many writers on British industrial relations for compiling, usually early in their careers, long and often boring accounts of the history of individual trade unions, it is surprising that with one or two notable exceptions the historical origins and development of industrial relations as a whole have not been particularly well surveyed.

This history is all the more significant in the light of continuities evident in those relations. The 19th-century stamp on much of Britain's trade union structure, for example, the constant appeal in workplace relations to "custom and practice" and the restrictionist culture on the shop-floor echoing earlier (and pre-union) craft-based strategies of job regulation, attest to the relevance of history to understanding current relations between worker and employer. Moreover, while certain aspects of those relations have changed over time, others have remained constant throughout, none more so than the general problem facing employers of how to exert control on the shop-floor while at the same time eliciting the cooperation necessary for large-scale organization to function.

It is possible that the compass demanded by a comprehensive historical analysis of industrial relations may have inhibited its elucidation. An understanding is required not only of the interplay of social, economic, political and legal forces dating back to the Industrial Revolution, but also of events in the preceding era during which aspects of the contemporary value system crucially influenced the cultural and attitudinal environment in which the system of industrial relations developed.

Comprehensiveness is a prime attribute of *History and Heritage*, which is an impressive work of scholarship. In seeking to answer the question "how did Britain's industrial relations system, its institutions, its characteristic texture and its place in wider society, come to be what they are?" Fox ranges far and wide to trace the divergent strands of British industrial relations. His concern is to identify those factors explaining both the historical continuities in industrial relations, and also those chance configurations of particular economic conditions, personalities, and so on, which have critically influenced the choice of route taken by those relations at different historical moments.

The preindustrial period has figured little in the teaching and writing on industrial relations history. Yet as Fox demonstrates, various events in the 17th and 18th centuries were to have far-reaching effects on later relations between master and worker, and in particular on the development of orga-

nizations seeking to protect and advance workers' economic interests. Of major significance at this time was the changing balance taking place between two forms of social control – the gradual (and far from total) shift away from control via the rights and obligations of paternalism, towards a form of rule based on the individual contract, in turn dependent on the forces of the market. Under the latter system, the traditional reciprocities of master and servant were replaced by a "cash nexus", centred on a more simple wage-for-effort relationship. This had various consequences for subsequent industrial relations, not least in the fostering of an attitude among craft workers involving "a larger independence of spirit and aspiration" than had been possible under traditional paternalist forms of control. This was to become manifest not only in trade unionism but also in the growth of measures designed to secure for the workers a high degree of unilateral job regulation and protection.

This early period also enables light

to be shed upon one of the major historical issues in industrial relations: why trade unionism took (and continues to take) a form which could so easily be accommodated by those in power, rather than developing a greater degree of revolutionary fervour. Fox explores beyond usual explanations such as the location of early union growth among the "labour aristocracy" of skilled craftsmen. He discusses, for example, the cross-cutting and vertical-bonding nature of various pre-industrial political and religious movements (such as the Levellers and Puritanism) which ensured that a simple "us-them" dichotomy did not clearly emerge. Instead a complicated pattern of alliances developed, with co-operation on some issues between employer and worker (particularly between smaller employers and their craft workers) countering opposition on others. This contributed to the early craft unions both identifying upwards with the lower middle class and concentrating on job-related issues to maintain their status, rather than asso-

ciating with the growing mass of unskilled workers and pursuing political militancy.

Despite the unrevolutionary nature of organized labour, it nevertheless pursued objectives at variance with the material interests of employers – in particular, their preference for a cheap and flexible work force. So why was the union movement not suffocated at birth? Partly the answer is to be found in the generally non-political character of trade unionism, and employers' preference for tolerating an ultimately accommodating and "respectable" labour movement, rather than seeking to smash that organization, and run the risk of removing a safety valve for class conflict, driving the movement underground and potentially radicalizing both its leadership and its members.

Fox shows that, in addition, factors such as a non-interventionist state, a period of economic growth and a lack of entrepreneurial conviction to wage total war against the unions (partly due to the public school system imbuing aristocratic, paternalist values in many

industrial leaders rather than a more single-minded dedication of commercial gain) allowed the union movement to become established. By the time employers were in a position to utilize a period of economic depression to pursue a root-and-branch attack on trade unions, the movement had grown too large (and due to the widening franchise, become politically too significant) for such a challenge to succeed.

In over 450 pages of closely argued account, surveying the broad span from the medieval period up to the second Thatcher government in 1983, a wide range of issues is handled both in detail and from a longer perspective. One of the general conclusions to emerge from this analysis is that up to the mid-1960s, the nature of the industrial relations system in Britain broadly reflected the patterns of trade unionism, bargaining and accommodation which had been gradually consolidated over many generations. In turn, this was the outcome of both working class strategies and initiatives, and a series of responses by employers and the state to those initiatives.

Unlike countries such as Germany, where a stronger state had helped bring about a more consensual approach to industrial relations and a high productivity, high wages policy, the system in Britain became based more on an adversarial approach, collective bargaining with both sides mistrustful of one another and the unions seeking to protect their position by limiting employer control over technological change and labour utilization. Nevertheless the British system was generally marked by an ultimate willingness to seek compromise solutions – an arrangement which rested in no small part on economic prosperity bringing continued gains to both sides.

It is this traditional system which Fox views as having been significantly modified since the mid 1960s, due to long-term economic failure and increased state action, latterly designed principally to reduce trade union power both at the workplace and within the state's own decision-making apparatus. For the author, this recent trend reflects an abandonment of the pursuit of consent in industrial relations and an increasing reliance on a sufficient power advantage to enforce policies. The historical continuities evident in industrial relations make this development under the Thatcher government all the more significant and far-reaching.

Some will no doubt argue that *History and Heritage* lacks a sufficiently strong theory to provide the necessary map to navigate through the historical detail (it is certainly possible to become bogged down in places). Nevertheless the book will be widely read and valued not only as a major source of reference but also as a starting point for closer study of current industrial relations.

Dr Blyton is lecturer in industrial relations at the University of Wales Institute of Science and Technology.



Chartist riots at Newport, 1839, from the cover of *History and Heritage*.

Enigmatic events

The Last Rising: the Newport Insurrection of 1839
by David J. V. Jones
Clarendon Press/Oxford University Press, £12.50
ISBN 019 8200765

There are not many points in the nineteenth century at which the historian can profitably speculate whether a revolutionary situation might have developed but did not. Foremost among the dates for consideration, however, would have to be November 4, 1839. At that time Chartism seemed to many contemporaries to pose the threat of the barricades. The Newport rising has been relatively well served

by historians. From the centenary publications in 1839 (most notably the great biography of John Frost by Lewis Williams) to Ivor Wilks's study published last year, the events of the winter of 1839 have provided a usable past for the Labour movement in South Wales. In the centre of Newport, Gwent, today is John Frost Square, named after the leader of the insurrection. Now comes Dr David Jones's splendid monograph which, at the risk of using a cliché, must be described as definitive.

The central question posed by the Newport rising is whether it was essentially a local event or part of a national insurrection. For the task of examining this intriguing problem David Jones is admirably equipped, having already made a thorough study of popular protest movements in Wales as well as publishing a general history of Chartism. His general conclusion is that the events of November 3-4 are best seen in a community context. South Wales in the early nineteenth century was a

unique industrial society, where the process of change was faster and the impact more socially divisive than perhaps anywhere else in Britain. The nature of the rising was formed by the regional environment, both geographical and ideological.

Unlike his mentor, Professor David Williams, Jones does not accept the view that the rising was intended as no more than a peaceful demonstration of strength. The events were unlike previous Chartist activities and the degree of secrecy, secret oaths, pious words, and violence were in marked contrast to the defiant openness and publicity of the wider movement. The trials, afterwards, observes Jones, tell us much about the nature of Welsh industrial society and class relationships, but almost nothing about the rising.

Because of this openness of the evidence many aspects of the rising still (and perhaps always will) escape us.

To what degree, for instance, did the Welsh Chartists expect support from their comrades elsewhere? Throughout the 1840s the charge was made in the radical press that Frost had been betrayed by his English and Scottish colleagues, William Lovett, Brontë's O'Brien, Porgus O'Connor and many others, believed that the events in Wales formed part of a plan for a national insurrection, drawn up at the end of the convention in September 1839. There seems little doubt that there was talk of such a general Chartist rising; but how far actual plans were drawn up and timetables agreed remains problematical.

The Last Rising is full of fascinating details of the march to Newport, the attack on the Westgate Hotel, and the rounding up and trials of the prisoners – who were tried before Mr Justice John Williams of Talpudde Infamy. At least 50 people were wounded and about 22 Chartists were killed in the attack, which means, says Jones, that "on this morning in November 1839

the British authorities inflicted greater casualties on the civilian population than at any other time in the nineteenth and twentieth centuries. In the last resort the nature of the rising was, and remains, enigmatic. In 1840 Edward Dowling, proprietor of the *Monmouthshire Mercury*, the leading local newspaper, predicted that:

"this insurrectionary movement will... be a subject of utter astonishment to the future historian of the country, when, like ourselves, he looks in vain for an adequate or palpable cause."

After all his subsequent researches the historian can only agree.

J. F. C. Harrison

Professor J. F. C. Harrison's most recent book is *The Common People: a History from the Norman Conquest to the Present*.

BOOKS

Friends in the north

Shakespeare: the "lost years"
by E. A. J. Honigsmann
Manchester University Press, £17.50
ISBN 0 7190 1743 2 and 1792 0

William Beeston reported to John Aubrey that Shakespeare had been a schoolmaster in the country. This rumour was taken up by Oliver Baker in 1937 and by E. K. Chambers, denied by Douglas Hamer in 1970, revived by the Jesuit, Peter Milward, in 1973, and now refurbished by Professor Honigsmann with some additional evidence.

The story that emerges can be summarized as follows. In 1579 John Cotton, a Lancashire man, began to teach at Stratford. In the following year he was asked to recommend a Catholic tutor for the household of Alexander Hoghton. His choice fell on William Shakespeare, then aged 16; and the young poet went off to Lancashire where, in addition to carrying out teaching duties, he put on entertainments of one kind or another, more successful, one presumes, than Holofernes's pageant of the Nine Worthies. In a short time he made such an impression on Hoghton that he was left a pension of 40 shillings a year.

Hoghton, who died in 1581, left musical instruments and a full manner of play books to his brother, and should he not wish to keep players, the instruments and costumes were to go to Sir Thomas Hesketh, who was urged to be friendly to William Shakespeare and Falk Ollom, and either to take them into his service or find them a new master. In due course Shakespeare was employed by Hesketh at Rufford, where there is a splendid hall suitable for plays.

The job was of brief duration, for

Shakespeare was back in Stratford in August 1582, in time to beget Susanna, and marry Anne a few months later. In 1585 or thereabouts, Shakespeare, Hesketh, was enrolled in Lord Strange's company. In 1586 he wrote "The Phoenix and the Turtle" to celebrate the marriage of John Salusbury to Ursula Halsall, the illegitimate daughter of the fourth Earl of Derby. He began to emerge as a dramatist; Spenser spoke of him as "our pleasant Willy"; and as Aetion; and John Weever, who knew Hoghton and other Lancashire gentlemen, wrote a sonnet in praise of Shakespeare – the honey-tongued author of *Venus and Adonis*, *Locrine* and *Romeo and Juliet*. Some years later Shakespeare wrote epigrams on members of the Stanley family, written for the tomb at Tong while the subjects were still alive.

Honigsmann does not pretend that he has absolute proof of his theories, but they are plausible enough. He answers the objections which spring to mind. If it was indeed the boy Shakespeare who went to work for Alexander Hoghton, why was he called Shakeshafte? Not, Honigsmann thinks, because he was deliberately using another name, but because it was a common variant, especially in Lancashire, and much nearer his real name than the "Shaxberd" he was called in the Revels accounts.

Hamer argued that as only one of Hoghton's servants received a larger annuity than Shakeshafte, he must have been over thirty, since the sums allocated to the older men were shared with the younger when they died. Honigsmann neatly disposes of Hamer's point by working out the ages of several of the other legates.

If Shakespeare was a poet, is it not odd to find him writing anti-popish propaganda in *King John* and elsewhere? Honigsmann replies that the excommunication of Elizabeth I, the Babington conspiracy and the threat of Spanish invasion inevitably led to a conflict of loyalties. Lord Strange, moreover, was anxious to prove his patriotism, and by getting his company to put on plays with an anti-catholic bias, he showed his loyalty. In 1593 he

was approached by the Jesuits to claim the crown in succession to Elizabeth; but this is one of Honigsmann's weaker points since *Henry VI* and *King John* were written before that date.

I find it difficult to believe that Shakespeare wrote "The Phoenix and the Turtle" in 1586, even though the execution of Salisbury's brother for complicity in the Babington conspiracy might explain the sombre tone of what was meant as an epithalamium, and, as Honigsmann urges, Shakespeare could not have said the couple were leaving no posterity after Ursula had given birth to a number of children.

My doubts are not due to the fact that Shakespeare was only 22 at the time, for he was older than Milton when he wrote the nativity ode, older than Blake when he wrote his *Address to the Muses*, older than Keats when he wrote his sonnet on Chapman's Homer. Nor are my doubts due to the comparative feebleness of Shakespeare's dramatic verse written several years later, for the plays were written under pressure. What I doubt is whether any poet could have written in such a style in the 1580s, and whether the mourning in the threnos can really be connected with the execution of Ursula's brother-in-law. It seems to have a more metaphysical origin. The poet would not have lamented Thomas Salusbury in such lines as:

Beauty, truth and rarity,
Grace in all simplicity,
Here enclosed in cinders lie.
Perhaps Salusbury's longstanding and probably unrequited passion for his sister-in-law, Dorothy, better fits the peculiarities of the poems. But to interpret the poem typically is to destroy its mysterious grandeur.

Apart from this, Professor Honigsmann's book is largely convincing, and the Lancashire connection is likely to become a permanent part of Shakespeare's biography.

Kenneth Muir

Kenneth Muir is emeritus professor and honorary research fellow of the University of Liverpool. His next book is *"Shakespeare: Contrasts and Contraversies"*.

Endless romance

Let Wonder Seem Familiar: endings in Shakespeare's romance vision
by R. S. White
Athlone Press, £16.00
ISBN 0 485 11256 6

Shakespeare employed conventions of romantic literature throughout his career, not only in his four last non-collaborative plays, to which the label of "romances" is often attached, but also in the comedies usually termed "romantic". In his more robust comedies, in the problematical comedies in which he seems least confident of endorsing the values of romance, and even in some of his tragedies, most obviously *King Lear*, R. S. White offers a well-informed account of the nature of the conventions on which Shakespeare drew, followed by a critical examination of Shakespeare's handling of these conventions in plays from *The Comedy of Errors* to *The Tempest*.

As his title suggests, Dr White is particularly interested in endings; he observes, and fruitfully explores, the tension between the "potentially endless" nature of romance stories and the demands of dramatic form. A result of this tension is that the romantic plays "share at the end the mixed emotions of wonder in timelessness, and regret at the fact of passing time". Dr White writes perceptively and suggestively about what he calls "long time" and "short time": in the romances, on the one hand, and in the tragedies, on the other.

Dr White's title implies, too, that he sees romance not merely as a set of conventions but as the projection of a vision, and to this extent his book is an investigation of Shakespeare's meanings, even of his "message". This emerges strongly in the view of Hecate in *All's Well That Ends Well*, as a representative of Shakespeare's continuing, but continuously varied, portrayal of hopeful, if irrational, optimism in opposition to cynical realism.

Dr White himself is good at seeing the best both in dramatic characters

and in the plays in which they appear, and this can (as he disarmingly admits) verge on sentimentality. In my most charitable moments I cannot conceive that at the end of *Twelfth Night* Sir Toby, Maria, and Sir Andrew may be "in pentitent hiding"; but it is rewarding to be shown the better side of Caliban.

On a larger scale, Dr White's spirited and eloquent appreciation of *Pericles* does not fully face up to those aspects of the surviving text that have caused it to be regarded as imperfectly transmitted, or collaborative, or both. But his concentration on the play's romance aspects yields its rewards, particularly in his emphasis on memory as "the fulcrum around which the play turns"; and if he is open to the accusation of re-creating the play in the light of his own vision of the greatness that he rightly discerns in its finest passages, this is only to say that he is exercising that power of transmutation through generosity that he ascribes to Shakespeare's most positive-minded characters.

If Dr White is over-generous to *Pericles* he is perhaps under-appreciative of *Cymbeline*, which he treats too much as if it were an undramatic narrative. Here he seems oddly lacking in response to Shakespeare's irrationality, to the strangeness of the play's style, the bizarre theatricality of the juxtaposition of plays that he himself, it is, after all, not just Cloten's body that Imogen finds beside her when she awakes, but his headless body, likely to be even more disturbing in the theatre than on the page.

To register occasional disagreement is to risk casting oneself as Antonio to Dr White's Prospero. It would be ungenerous not to record that he is often subtly responsive to verbal nuance, that his perspective enables him to point to interesting relationships between plays that are not usually illuminated together, that he makes illuminating comparisons between Shakespeare and some of his contemporaries (especially Spenser), that he writes particularly well on *The Tempest* (especially on Ariel's songs) and that his argument is carried through at a consistently high level.

Stanley Wells

Dr Wells is senior research fellow of Balliol College, Oxford and general editor of the Oxford Shakespeare.

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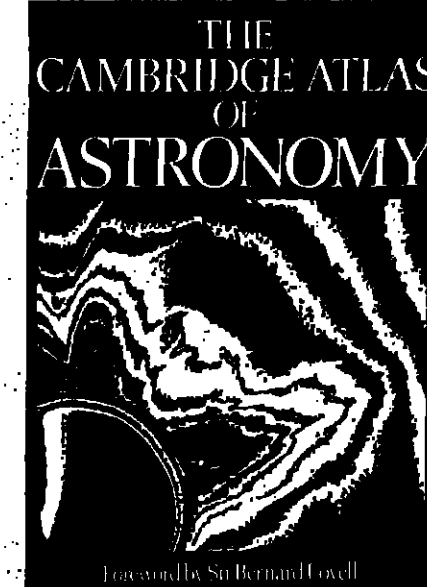
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John Donald, £18.00
ISBN 0 85976 109 6

Dr Robertson demonstrates convincingly that the political controversy over whether Scotland should, like England, have a militia during the Seven Years' War and the War of American Independence, raised issues which were of central concern to a number of major Scottish philosophers and literati, and influenced the development of their ideas. Moreover, though the debate arose in specific circumstances in the mid-18th century, it was intimately linked with interpretations of Scotland's past and of her place within Britain under the 1707 Union of Parliaments.

The problem of Scotland's role within the union was one which obsessed many Scots. The writers who favoured the creation of a militia all accepted union, but were concerned that Scotland should both retain a separate

identity and at the same time play a major and respected part in the new state. The refusal to extend the 1757 English militia scheme to Scotland was seen by many as an insult, suggesting that Scots were not to be trusted. As the last Jacobite rebellion had been suppressed little more than a decade previously such mistrust might be understandable, but it was none the less insulting. Those undertaking the militia agitation varied considerably in their attitudes, as Robertson makes clear, but all saw the controversy as being concerned with much more than just the question of whether Scotland would be trusted or not.

It was seen as an issue which would serve to raise the general level of national consciousness, civic responsibility and social cohesion. Indeed Robertson suggests that for many these hoped-for effects of the debate were its most important aims; whether Scotland actually got a militia or not was secondary. To specifically Scottish issues were added more general ones: the old debate about the dangers of professional armies and the contrasting virtues of citizen militias and fears of wealth were leading to the impending collapse of civilization, and therefore required balancing (or replacing) by a return to older and purer martial virtues.

Robertson's book is wide-ranging, its arguments complex and subtle, firmly putting in its political and intellectual context a major debate that has not been studied in its own right

before. The book does give rise to a few reservations, however. The influence of Hugh Trevor-Roper, who supervised the thesis on which the book is based, can undoubtedly be seen in some of the book's major virtues. But it is also perhaps responsible for some of the book's few vices, as they reflect Trevor-Roper's well known (not to say notorious) attitude to Scotland. Robertson is undoubtedly correct in stressing that the militia was an issue to which Scots were particularly sensitive because of the strength of the myth of the country's "martial heritage", of the way in which Scotland's identity was held to be closely bound up with the military glories of the past. But Robertson appears to suggest that this archaic heritage of heroic prowess was Scotland's only legacy from the past—a legacy of violence from which union provided a happy release—apart from the "imperial vision" of those far-sighted Scots who had (from the 16th century onwards) the sense to see Scotland's natural consummation and lying in becoming part of an all-British state.

Many historians (by no means all benighted Scottish nationalists) would see this as a specifically unionist interpretation ignoring other aspects of Scotland's past so as to depict pre-union Scotland as governed by violence—the "martial heritage"—and lacking any political institutions and/or constitutional developments worth taking seriously. It is true that this was a widely accepted 18th-century view;

in reaction to the Scottish parliament's suicide in 1707 anti-unionists held Scottish political institutions had betrayed her, pro-unionists held that they had been thankfully abandoned in favour of the superior English constitution. These are understandable 18th-century perspectives, but the 20th should surely have developed a little beyond them.

It is perhaps symptomatic that Robertson seems to find it difficult to credit the Scottish parliament with its proper name, presumably because it is not felt to merit it, even taking refuge in the peculiar circumlocution of "the Estates proper". To Robertson those involved in the militia issue who were solely concerned with its specific Scottish aspects were seeking "pathetic cultural substitutes" instead of respectable wider horizons. One really begins to wonder what this school of thought fears about the Scots that leads it to denounce so furiously any interest in things specifically Scottish. "Narrow" such interests may be, seen from some perspectives, but surely is interest in things English seen from the same viewpoints—even if dressed in greater respectability by being labelled British.

David Stevenson

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Restoring order

The Rise and Fall of the Second Empire 1852-1871
by Alain Plessis
translated by Jonathan Mandelbaum
Cambridge University Press, £22.50
ISBN 0 521 25242 3

The Second Empire long suffered from a bad press. In large part this was because of its origins in a brutal coup d'état. Republican historians like Charles Seignobos tended both to exaggerate the regime's weakness—its lack of moral authority, dependence on the army and bureaucracy and apathetic peasant voters—and at the same time the strength of opposition to it. In this century facile comparisons have been drawn with fascist regimes.

It was the growth of interest in economic and social history in the interwar years and the work of historians like Marcel Blanchard which first challenged this essentially negative and political interpretation. Alain Plessis can be regarded as the latest proponent of the new orthodoxy, which emphasizes the structural changes occurring in the economy due to the construction of railways, the development of banking, technical innovation and concentration in major industrial sectors, and growing commercialization in agriculture. In spite of the survival and even continuing prosperity of many traditional sectors of the economy, these changes are presented as the "birth of modern France". Moreover, and allowing for the persistence of massive social inequalities and widespread poverty, increased productivity brought improved living standards for most of the population. The achievement of the régime, and indeed of the Empire itself, in restoring political order after the long mid-century crisis and in deliberately setting out to establish conditions favourable to entrepreneurial activity and economic modernization is fully recognized.

Politically also a new interpretation has gained dominance, with recognition of the measures of liberalization taken in the 1860s, and of the fact that, they were in large part made in concessions to conservative and liberal critics anxious to restore parliamentary government as a means of controlling the Emperor's wilful fantasies the spheres of free trade, inflationary financial policy and foreign affairs. The major contribution of Republican and socialist opponents of the régime was in fact to re-create the "red" menace and encourage the reformist of the "Party of Order" of 1868. With support from the latter the establishment of the Liberal Empire with the Ollivier Ministry in January 1870 might well have stabilized the régime if the Emperor, apparently in search of a diplomatic triumph, had not been dragged into a war, for which, as he well knew, the French army was poorly prepared. This absurdity, which remains difficult to explain, appeared to justify Republican criticism of a governmental system based, even after liberalization, upon excessively strong executive authority.

In which direction will historians turn next? The history of the period is already being renewed at local and regional level, by means of detailed analysis of social relationships and political processes. The next general study of the period will need to take into account far more fully the variety and complexity of mass as well as elite political behaviour, and enmesh the vague generalizations which still characterize even a work as good as that of Plessis. It might also be able to relate the Empire more effectively to the period of intense crisis which preceded it. To a large degree its establishment and character can be explained only as a reaction to the economic and social situation prevailing before 1852 and 1851. The place of this book within a series, another volume of which concentrates on the 1848 Revolution, obviously inhibits Plessis here.

This volume in *The Cambridge History of Modern France*, published first in Paris in 1973, is the best general history of the Second Empire so far published, and fortunately is not as outdated as the rest of the series.

Roger Price

Roger Price is reader in history at the University of East Anglia.

BOOKS

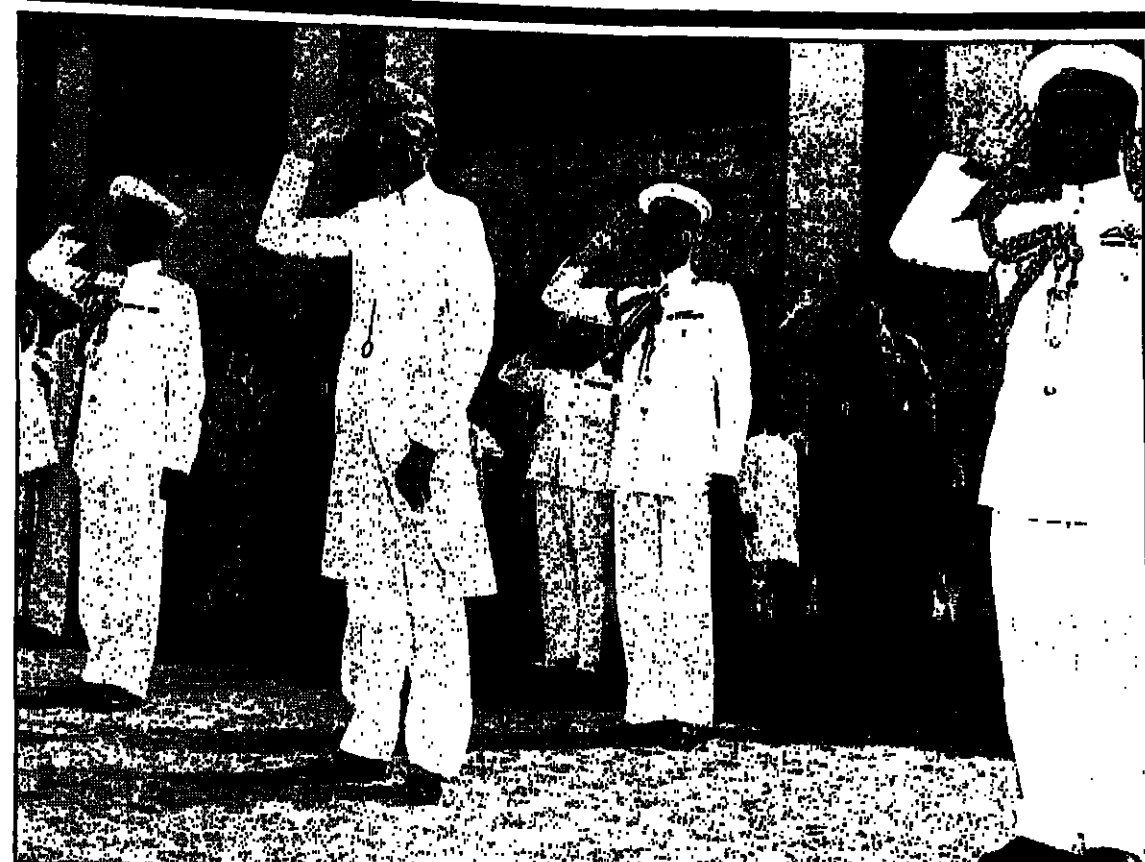
Islam in danger

Jinnah of Pakistan
by Stanley Wolpert
Oxford University Press, £22.50
ISBN 0 19 503412 0

Mohammed Ali Jinnah was born "somewhere in the 1870s" in Karachi. His grandparents lived within thirty miles of Rajkot, a boyhood home of his eventual prime opponent, M. K. Gandhi. The two shared a mother tongue, Gujarati. As young men both were there called to the bar. Gandhi returned to become the proverbial briefless barrister, and was glad to be invited to make his living in South Africa. Jinnah by contrast moved into the upper echelons of Bombay's legal establishment and soon became one of its more prosperous members.

From their varying standpoints both were staunch Indian nationalists. It was in Bombay in 1904 that Jinnah first attended an annual meeting of the Indian National Congress. A decade later he was its principal Muslim member. Still only around 40 he had been a member of India's Imperial Legislative Council since 1910, served on Lord Islington's Royal Commission on the Indian Public Services, and led in 1914 a Congress deputation to London. By 1916 he was president of the All-India Muslim League as well, and that year triumphantly negotiated the unique Lucknow Pact by which Congress and Muslim leaders agreed the communal percentages they would seek in India's future legislatures.

How did India's "ambassador of Hindu-Muslim unity" become transformed into the Quid-i-Azam, the Great Leader who led his Muslim countrymen into their separated state of Pakistan? Throughout the 1920s he remained a leading member of the Imperial Legislative Council and was more than once president of the Muslim League again. In both capacities he perpetually probed every opportunity to revivify the accord that had characterized the Lucknow Pact. But upon his own Muslim side and upon the Congress side too, that became harder and harder. Nadir came in the early 1930s when at successive Round Table Conferences in London a communal agreement turned out to be totally



August 1947: Jinnah, after being sworn in as Governor-General of the new state of Pakistan, salutes a march past of troops.

unattainable. By then Jinnah had settled in London, and while practising at the Privy Council bar had forlornly sought to find a seat in the House of Commons, whether upon the Labour or Conservative side he did not seem to mind. That might have been the last that was heard of him. But after the failure of Gandhi's successive civil disobedience movements in the 1930s, India returned to electoral politics, once again, and Jinnah found himself called back there to restore the fortunes of the Muslim League.

For many that would have seemed a vain task. Most Muslim politicians belonged to separate provincial organizations, and unlike their Congress contemporaries were not of a mind to take their orders from a central Muslim body. Congress, moreover, now won remarkable victories, both at the central legislative elections in 1934, and even more at the provincial elections in 1937, whereas by any standard the Muslim League fared badly. That was cause for concern in itself. Yet more so was the deepening awareness that "the progressive realization of responsible government" which the

British had promised back in 1917 not merely relegated the Muslims to being a permanent overall minority, but, except in the varying circumstances of the Muslim-majority provinces in the northwest and Bengal, meant that they would have no share at all in the power being transferred. Starting among elite Muslims in the half dozen or so Muslim minority provinces, growing outrage at Congress's exclusion of distinctly Muslim interests soon spread to wider and deeper circles in the community, till the cry of "Islam in danger" went up, that over the next five to ten years spread to India's Muslim majority areas as well.

At the centre of this gathering storm stood the elegant, disciplined, increasingly singleminded, consummate politician, Mohammed Ali Jinnah. There were four flanks on which he had to operate. The claims of Gandhi's Congress to represent the totality of the Indian national movement had to be rebutted. Free-wheeling Muslim leaders in the Muslim majority provinces had to be forced into line. It was personally necessary to cajole the British into treating Muslim claims

on an equality with those of the otherwise preponderant Congress. And the inchoate anxieties of India's much dispersed Muslim forces had to be provided with a vision that could evoke their united support. It was this that impelled the Jinnah idea.

As the conflict mounted all this entailed utter intransigence towards the correspondingly implacable demands of the Congress. It involved the often overlooked task of ensuring that when Pakistan came into being it could have some territorial reality. It necessitated a remorseless refusal to compromise with the penultimate Viceroy, Lord Wavell, in 1945; in the end with the Cabinet Mission in 1946; and in 1947 with the last Viceroy, Lord Mountbatten. It called too for cold calculation as to when the ardour in the ranks of India's dispersed Muslim communities should be allowed to make itself felt. Throughout Jinnah's steely nerve never broke. His Pakistan came into being in 1947.

It is now thirty years since the last, and only, western biography of Jinnah was published, and another one was due. Professor Wolpert writes en-

gagingly and sensitively, informatively, and perceptively. He is particularly good at elucidating the elemental forces propelling Jinnah's climactic campaign. They started by being personal. "I was considered a plague and shunned. But I thrust myself and forced my way through... now the situation was different". But they were always more general as well. "Our blood had become cold, our flesh was not capable of working, and the Muslim nation was for all practicable purposes dead". "That was the condition of Muslim India seven years ago". Jinnah was wont to say, "but today, the sick man has recovered from his death-bed". "I am thankful to God that Muslim India is awake".

He gave his enemies no quarter: "the leaders of Congress are so dishonest, so crooked, so obsessed with the idea of smashing the Muslim League that there are no lengths to which they will not go to do so". "So long as the Congress and Mr Gandhi maintain that they represent the whole of India... there can be no compromise or freedom... We do not want the Congress to become the trustees. We have now grown up. The only trustee of the Muslims is the Muslim nation". In the end he was astonished at his own success. "In five years our renaissance has been a miracle of achievement. I begin to think it has been a dream." It was indeed an extraordinary achievement for a gravely ill man entering his seventies.

There will shortly be more clinical accounts of Pakistan's origins. Professor Wolpert is curiously imprecise on a number of issues, from Jinnah's negotiations over joint electorates and his fourteen points in the 1930s to Britain's August offer in 1940, and even upon the reasons for Jinnah's deep anger with Congress and the British in the summer of 1946. Now the Jinnah archives have been more fully assembled, larger use of them than is apparent here will no doubt soon be made. The elaboration and adoption of the Pakistan idea will need closer attention, as will the vital fact that the adherence of areas territorially essential to Pakistan's existence was until the very end (and beyond) one thinks, of course, of Kashmir) highly problematic. Later authors will do well, however, to immerse themselves in the fateful crescendo of animus which Professor Wolpert so faithfully portrays.

D. A. Low

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Workers' demands

The Working People of Paris, 1871-1914
by Lenard R. Berlanstein
Johns Hopkins University Press, £23.05
ISBN 0 8018 3241 1

After asserting their grievances in spectacular fashion in the Commune of 1871, the working class of Paris receded into the background of history until the extensive and often violent strikes of the 1930s. Yet Paris continued to develop as one of the great industrial centres of Europe, and this development is the subject of Lenard R. Berlanstein's book, which presents his wide-ranging research in a concise and stimulating form, and challenges many accepted ideas.

He concentrates on two contrasting groups. Outside the walls of Paris proper, in bleak suburban towns like Saint-Denis and Ivry, a factory proletariat was created by the growth of modern industries of all kinds, including the most modern of all, car manufacturing. At the other end of the scale, though rightly seen as part of the "working people", were the white-collar workers: shop assistants in the great department stores, clerks in the expanding state and private bureaucracies. In between were the workers in transport and the service trades, and the traditional craft-based industries of the capital; in the latter, skilled workers were able to hold their own in the luxury branches, but most of the work was done by semi-skilled and sweated labour, and Berlanstein has much of interest on these "specialized" workers.

Life for most working people remained hard. Depression and unemployment caused acute distress in the 1880s, and even in the 1900s there was little to spare once food and rent had been paid for. Yet as Berlanstein shows, consumerism and mass entertainment were beginning to penetrate to the workers, and one sign of rising expectations was the development of family holidays, which Berlanstein traces fairly precisely to the 1890s and links with declining infant mortality. Workers were beginning to demand their share of the delights of the *belles époques*, and were increasingly less tolerant of low wages, long hours, and poor working and living conditions.

Like other recent historians of this subject, Berlanstein sees the specific causes of militancy in the workplace and the work process: employers were attempting to devalue traditional skills, to increase the pressure of work, to enforce new disciplines and to assert the authority of management. This is illustrated especially clearly in engineering works, where traditional piece-work payment came under threat, and where unpopular foreign

pushed into the front line by managers, were often at the centre of strikes and agitations. But Berlanstein shows similar pressures being applied in offices, and the loyalty of white-collar workers, who had been inclined to identify their interests with those of the firm, came under severe strain. The stereotype of the *petit bourgeois* clerical worker has to be qualified in Paris, where a minority at least were attracted to left-wing political action.

There is little in Berlanstein about socialist parties and doctrines, the traditional preoccupation of the labour historian. But he shows clearly enough why most working people—not only the artisan elite, whose political role has been much emphasized in the past—turned from radical Republicanism to socialism. In the suburban communities, socialists could capture municipal control by campaigning on issues like health and housing. However the violent character of so many strikes, and the popularity of revolutionary syndicalism in the 1900s and communism after the war, suggest a deep disillusionment with conventional parliamentary democracy. Berlanstein sets out a powerful case for believing that the failure of the Republic to deliver working-class prosperity, and the strains and pressures caused by continuing economic change, kept working people in the position of an alienated and disinherited class.

Robert Anderson

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Preaching aids

The Preaching of the Friars: sermons diffused from Paris before 1300
by D. L. d'Avray
Clarendon Press: Oxford University Press, £25.00
ISBN 0 19 822772 8

Sermons may be an important instrument of mass communication in any age, and never more so than among the literate, semi-literate and illiterate audiences of 13th-century Europe. Their abundance speaks for itself; a *Reperitorium* listing known Latin sermons in the period 1150-1350 fills nine volumes and 7,300 pages. Pious worshippers in some Dominican churches might have heard up to 250 sermons in one year. The sheer bulk of manuscript material, and the fact that originally was not the object of medieval preaching, have led most historians to concentrate on the work of the best-known preachers, leaving large areas unexplored. David d'Avray has shown that there are rich veins of ore to be found amid the dross.

He has chosen as his subject the



This Degas charcoal drawing, circa 1895, is from a catalogue to an exhibition *Degas: the Dancers* held in Washington. It is published by Wiley at £22.95.

model sermon collections used by the friars, which were written in Latin and diffused from Paris before 1300. These collections contained only the framework for sermons, to be adapted to different audiences as occasion required; even they contained no more than the principal divisions and distinctions of the subject, and relevant citations from Scripture, under each heading. Bound up in pocket-book sized volumes, they could be carried by friars on their preaching journeys, and used in conjunction with other preaching aids, such as collections of moral stories (*exempla*). Many were copied by the Paris stationers using the *pecia* system to produce a number of copies from a single exemplar. They could be adapted to any vernacular; some may also have been used for preaching in Latin to an academic audience.

D'Avray's book, critical and carefully documented, is an important pioneering work; it challenges facile generalizations and is full of fresh insights. The sermons as he sees them were directed principally towards the articulate, both clerical (even academic) and lay; they might be preached at various levels, including the popular, but always assumed a "higher" tier of basic catechetical teaching. Though Paris was important as a centre for theological training and

book-production, the preaching of the friars was only indirectly influenced by scholasticism, and owed far more to the development of older techniques of exegesis and exposition in theological centres. Studying these sermons in comparison with sermons from other periods, from the Carolingian age to the 17th century, can illuminate the habits of thought characteristic of each age as well as, isolating enduring themes. They were not intended solely for urban audiences; some of their imagery is drawn from feudal society, and, though a few sermons were intended specifically for wealthy townsmen, mercantile language goes back to the Gospels, and the various types of imagery should be seen as "one manifestation of a mental habit". This book, like the sermons it describes, is directed simultaneously to readers at different levels. For general readers there is a clear framework of ideas; for those with research interests illustrations from unpublished sources fan out in all directions, and invite further exploration. It is a seminal work of real achievement and great promise.

Marjorie Chibnall

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On the home front

Neutrality: a policy for Britain
by Peter Johnson
Temple Smith, £9.50 and £3.95
ISBN 0 581 2652 2 and 255 5

Neutrality is Peter Johnson's answer to Dean Acheson's famous remark in 1962 that Britain had lost an empire but not yet found a role. Neutrality, Johnson claims, is that "true role" which Britain has been seeking. Not many people in high places would disagree with his view that Britain did not need the protection of US nuclear power and should scrap its strategic nuclear systems. However, he does recommend that the country should possibly retain its tactical nuclear systems, leaving a final decision to be taken after the waters of neutrality have been tested. He clearly expects the waters to be warm, but even if a neutral Britain were to be attacked by a superpower war, destruction would be less than if Britain remains a member of Nato, and then gets dragged into a superpower war as a front-line state.

Membership in the alliance, he believes, now constitutes a grave danger to British security. The postwar defence arrangements were justified at the time they were created, but they are no longer. Britain has no moral compulsion to take part in the defence of West Germany or become involved in the affairs of Central Europe, Britain should therefore pull back its defences, using them solely for the protection of the homeland; he consoles himself with the thought that the

answers are more superficial than his questions, though presumably at this stage he is keener to establish goals and principles rather than providing lengthy justifications. In this regard his underlying theme is that Britain would be safer and better off with a policy of neutrality. His belief is strengthened by his brief examination of the history of various neutral countries: while he notes the ups and downs of some of them, he finds their general record encouraging.

Britain, according to Johnson, is "neither a target nor a factor of any real consequence in the calculations of the greatest powers." Consequently, he argues, there is no military threat to British independence and integrity which it cannot deal with itself. Those in power would strongly disagree, just as the majority of public opinion would disagree with his view that Britain did not need the protection of US nuclear power and should scrap its strategic nuclear systems. However, he does recommend that the country should possibly retain its tactical nuclear systems, leaving a final decision to be taken after the waters of neutrality have been tested. He clearly expects the waters to be warm, but even if a neutral Britain were to be attacked by a superpower war, destruction would be less than if Britain remains a member of Nato, and then gets dragged into a superpower war as a front-line state.

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mainland European allies would fill the holes which were left, and that it is now impossible for the United States to leave the European stage. Nor does Johnson believe that Britain has any moral obligation to join the United States in world affairs. The "special relationship" was never special, he argues; the United States always acted in its own interests, and Britain should do the same. But neutrality, in Johnson's view, should not be synonymous with isolationism. He hopes that a neutral Britain would play "a full part" in world affairs.

It is doubtful whether many of those people to whom Peter Johnson appeals would be impressed by many of his arguments, and he would probably come out badly from the "open discussion" and referendum which he favours. The main criticisms would be directed at his breezy treatment of the possible international repercussions of a British move towards neutrality. Johnson seems to foresee no serious difficulties in either the political or commercial dealings. He could just be right. Stranger things have happened; but would any foreseeable British government take such a risk?

Because neutrality is not "policy-relevant" it would be easy to dismiss Peter Johnson's book. This would be a pity. Furthermore, although there is a bigger and better book to be written about the subject, Peter Johnson deserves credit for reminding the defence establishment of the extent to which the 35-year-old consensus on defence has cracked, for telling all of us some home truths, and for trying to put the interesting non-issue of military non-alignment on the national agenda.

Ken Booth

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BOOKS

Human variables

Models of Category Counts
by Bernard Fingleton
Cambridge University Press,
£17.50 and £6.95
ISBN 0 521 25297 0 and 27283 1

A category count simply records the number of times that sampled individuals have a particular combination of characteristics – for example, the number of unemployed people aged 25–35 who identify themselves with a particular political party. The systematic arrangement of all such counts over each category of employment status, age group and political party constitutes a contingency table. In this example, the table has three dimensions, and each dimension has a number of possible categories which may be nominal (employed, retired, unemployed for employment status) or ordered (the categories of age). Such tables have been an important way of presenting numerical information since the earliest days of statistical inquiry into social processes.

Until recently, emphasis was placed on the special case of two-dimensional tables – political allegiance for each category of employment status, for example – and a variety of measures were proposed for assessing the strength of the relationship between the two variables. The case of independence is especially important, since it implies that the relative popularity of each political party is the same for each category of employment status. The need for a more general framework was acute, not only because most practical situations called for the inclusion of more than two variables but

also because the simple analysis of two variables – political allegiance and employment status – without taking into account other factors (for example, sex, age, social class) may be wrong. It could lead to misinterpretation and an invalid conclusion as to the real relationship between the two original variables.

What was needed – and what has been developed – is a more general framework, somewhat analogous to regression analysis for continuous variables, where the influence of each of the dimensions may be modelled so as to understand and quantify the main sources of variation in the category counts. The log-linear model seeks to model the logarithms of the category counts, the various dimensions of the table and the individual categories within each dimension being used as explanatory variables to account for the variation in the category counts. In the original example, is it the case that the relative popularity of parties may be explained simply in terms of employment status or is there also an age effect and if so how do the two combine together? Is it the case, for example, that the combination of being both young and unemployed leads to a different relative choice of parties than we would expect simply from the separate effects of being young and being unemployed? Such questions need a careful formulation using a statistical model; and the ideas of independence in the simple two-dimensional table have been extended to higher-dimension tables and methods devised for quantifying and interpreting dependencies where these exist.

This book is a carefully and thoughtfully written attempt to achieve an intermediate level, setting out the main log-linear framework and methods without presenting a full account of the statistical theory. Given the confines of 165 pages, the discussion is thorough and the main practical steps are carefully explained. Some computer listings for various packages are also given. Without detracting from the main presentation, Fingleton

provides an account of more recent advances and describes a number of areas of remaining difficulty. The strength and flexibility of the log-linear approach is also a weakness, since one of the major problems in practical applications is to choose a log-linear model which adequately fits the data. For a three-dimensional table, there are relatively few models to choose from, but the possibilities escalate very rapidly: there are literally thousands for a five-dimensional table. This needs a systematic approach; and Fingleton describes methods for testing the adequacy of any particular model and of arriving at the choice of a suitable model. In general, however, this is still a grey area; and although Fingleton carefully describes the most common model selection methods, he could have provided a little more critical commentary and evaluation of the alternatives.

Another problem stems from the fact that the number of separate category counts grows rapidly as more dimensions are introduced into the table. The underlying statistical methods for model selection and testing come under strain, the case of large multi-dimensional tables with comparatively low counts in many cells being a perennial problem. A solution is to reduce the number of category counts by combining some of the categories in a dimension can be combined, effectively collapsing the table by removing one dimension. A major difference between log-linear models for category counts and regression models for continuous variables is the number of model parameters commonly included in fitted models. In regression analysis, it is easy to add one or two terms and to explore the improvement that this

makes. For log-linear models, the inclusion of one additional interaction can involve a substantial number of extra parameters; and this is a major problem both for simplicity and interpretation. Where the categories of any dimension are ordinal, such as age or social class, additional simplifications can be gained by a more parsimonious model specification taking the ordering into account. This is highly desirable where appropriate; and a good description is given of this.

The book concludes with a chapter containing special types of model, such as marginal symmetry and the move-stayer models.

Tim Holt

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Pioneer farming

Technology and Agricultural Development in Postwar Japan
by Penelope Francks
Yale University Press, £22.50
ISBN 0 300 03272 6

Dr Francks provides a vivid account of the traditional farming system of the Saga plain of northern Kyushu and its modernization during the 1920s.

By the mid-19th century, there had evolved on the plain a complicated system of rice farming, the chief characteristics of which were determined by reliance on deeply-incised creeks as source of irrigation water. Seepage of hard-won water from inundated paddy fields was minimized by elaborate methods of ploughing and soil preparation; mud was ladled from the creeks on to the fields (mud-raising provided fertilizer and also enhanced the water-carrying capacity of the creeks); and partly in order to spread the use of labour evenly throughout the year, most farmers planted both early and late-maturing varieties of rice.

Farming on the Saga plain demanded labour in quantities unusual even by the standards of pre-modern Japanese agriculture, but intensive and meticulous land use resulted in high yields per hectare. Yields would have been even higher had it not been for the depredations of an insect – the three-brooded rice stem borer – whose life-cycle requirements were met, almost ideally, by the cultivation during the farming year of both early and late-maturing varieties of rice.

Following various futile attempts to eradicate the rice stem borer, local farmers in the 1920s turned their attention to modernizing the traditional irrigation system, which hitherto had depended on the use of treadle-operated water wheels. In 1922, there began an ambitious scheme to introduce small pumps powered by cheap electric motors. Largely on the initia-

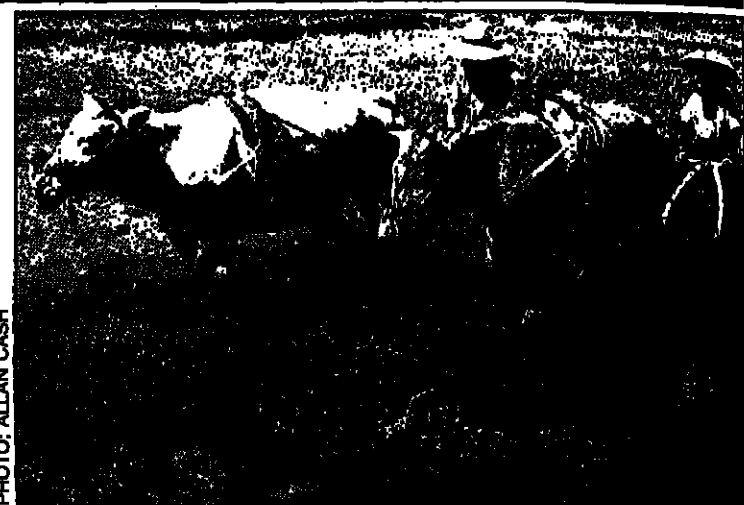


PHOTO: ALAN CASH

tive of the local agricultural association, this scheme was quickly carried to a successful conclusion, and by 1924 electric pumps had come into widespread use throughout the plain.

The adoption of the electric pump caused a swift and far-reaching transformation of the traditional farming system. Efficient mechanical pumps reduced the need for labour and enabled farmers to abandon the cultivation of early rice in favour of higher yielding late-maturing varieties. This switch to late-maturing rice meant the disappearance of the rice stem borer and prepared the way for a rapid rise in yields – indeed by the 1930s, rice yields in the Saga plain were among the highest in Japan.

Dr Francks is at her best when discussing ploughing, mud-ladling, cropping patterns and other minutiae of farming on the plain, and when chronicling the arduous campaigns against the rice stem borer. But while she provides a convincing portrait of farmers struggling to overcome environmental constraints, her attempts to fit Saga into the national context are less successful. Saga in pre-war years was very much a special case, as is witnessed by the difficulties that Japanese scholars have encountered in trying to accommodate the prefecture within regional categories of agricultural

BOOKS

House trained

The Taming of Evolution:
the persistence of nonevolutionary
views in the study of humans
by Daryl J. Greenwood
Cornell University Press, \$24.95
ISBN 0 8014 1743 0

Written by a professor of both international studies and anthropology at Cornell University, this unusual book is one of the most intriguing contributions to what has become known as the sociobiology debate that I have read for some time. In his preface, Professor Greenwood tells us that *The Taming of Evolution* is based on his contributions to an interdisciplinary undergraduate course on biology and society. That course must have been an interesting experience for all concerned.

Greenwood's argument is simply stated, although to defend it he moves rapidly between classical, medieval, early modern and contemporary thinking. There are, he suggests, "a small set of recipes for biocultural arguments". In particular, the nature/nurture debate has gone on within essentially the same terms of reference in the western world for over two millennia. These terms of reference are, he asserts, the pre-evolutionary assumptions of the classical doctrine of the four humours. It was Charles Darwin's great achievement to replace such theories with an evolutionary world-view whose terms of reference completely undermine the nature/nurture debate. Despite this, however, many of Darwin's successors have ignored the radical implications of this world-view, preferring to continue the nature/nurture debate along traditional lines; hence the idea that evolution has been "tamed".

Greenwood's thesis depends on the antithesis between humoralism and Darwinism. The former sees the cosmos as providential, hierarchical and static. There are fixed categories in nature, each species possessing essentially distinct qualities by virtue of the proportions of the different humours it contains. Humours are acquired geologically (typically, through "blood lines") and environmentally (typically, through the influence of local place), and it becomes a matter of empirical inquiry to determine how much of each influence – nature versus nurture – is involved in the production of a given species' character or "temperament". Since the humours govern both physical and behavioural characteristics, and since there is a correspondence between nature and human nature – the microcosm and the macrocosm – knowledge of the natural order is presumed to hold the key to the administration of human affairs.

Greenwood contrasts this world-view at every point with Darwin's. For Darwin, the cosmos was non-hierarchical and dynamic. There were no fixed categories in nature, and each species was a mere temporary existent possessed of no essential qualities whatsoever. "Variation", Greenwood asserts, "was the centrepiece of Darwin's world-view". For this reason, any inquiry into the respective contributions of nature and nurture in the formation of specific qualities was pointless, for no such qualities were held to exist. Finally, the absence of any providential order embracing both nature and human nature undermined the idea that evolutionary laws had any moral or political relevance. In revolutionizing the theory of classification, Greenwood asserts, Darwin "demolished" part of the foundation of existing moral systems – without, of course, replacing it with another.

On the basis of this contrast, Greenwood has little difficulty in tracing what he terms "simple continuities" between pre- and post-Darwinian nature and culture. He compares, for example, the racial typologies of the 16th-century humanists Jean Bodin and Robert Burton with the supposedly evolutionary writings on race and character of Darwin's cousin Francis Galton. Instead of a radical departure guided by the Darwinian principles of reproduction and variation, of course, he finds essentially unchanged "humoral" typologies; and the same conclu-

sion is drawn with respect to the more recent constitutional typologies of Ernst Kretschmer and W. H. Sheldon. Greenwood dismisses virtually the whole of the literature on race, national character, constitutional types and eugenics of the past century as an un-Darwinian hang-over from our humoralist past.

In my view this indictment is very largely justified. Indeed, it will not come as much of a surprise either to historians of evolutionary theory or to evolutionary biologists. Greenwood's contrast between humoral and Darwinian world-views is close to Ernst Mayr's familiar distinction between "essentialist" and "population" thinking. Part of Mayr's thesis, now fairly widely accepted, is that genuinely Darwinian (or population-based) thinking has caught on only very slowly among evolutionary biologists. What Greenwood adds to this is the realization that it has caught on most slowly of all among those anxious to apply evolutionary theory to human society.

If this is reasonably straightforward, what follows is perhaps less so. For in the last part of his book, devoted to "complex continuities", Greenwood argues that even some of the best-known recent attempts to apply Darwinism to human affairs are still essentially humoralist. In a chapter on human sociobiology largely devoted to the work of E. O. Wilson, Greenwood argues convincingly that Wilson's work on human behaviour "has been fully domesticated by an ancient Western cultural vision". Focusing in particular on Wilson's speculative book *On Human Nature* (about which it has to be said that it is hard to find a good word these days), he suggests that the very terms of Wilson's analysis – and in particular his quest for an understanding of "man's ultimate nature" – are fundamentally non-evolutionary.

Although I have always thought that Wilson's work on humans is severely flawed, I found Greenwood's distinctive perspective enlightening. His insistence that the terms in which much human sociobiology has been pursued during the past decade – terms such as nature/nurture and constraint/freedom – have no place in evolutionary biology is, of course, correct. Moreover, his suggestion that it is the ideological power of such terms within the humoralist world-view that gives them their continuing appeal is, in my view, almost certainly correct as well. Greenwood argues that one of the great challenges of the Darwinian world-view is the development of ethical and political principles independent of our knowledge of the natural world. His book demonstrates how far we are from facing up to this challenge.

John Durant

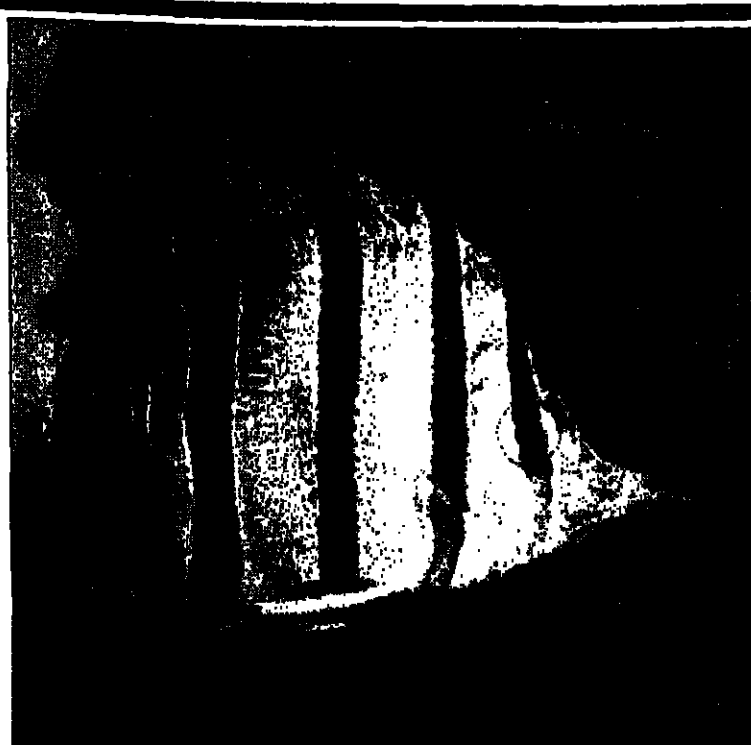
John Durant is staff tutor in biological sciences at the department for external studies at the University of Oxford.

Global views

Principles of Remote Sensing
by Paul J. Curran
Longman, £11.95
ISBN 0 582 30097 5

The continuing drought in Africa is of great concern to everyone. Indeed, for the past decade, we have been made aware of the problems facing the starving populations in these semi-arid regions. The immediate action has been for governments to provide food for the people through direct aid, money raised by individuals, and through "pop" records. This short-term action, however, avoids the fundamental issue of understanding the reasons for the drought and preventing its continuation. Such a plan requires the implementation of realistic agricultural policies, together with a critical understanding of the local and global weather and climate through a monitoring of the environment.

Man may be adversely affecting his environment in a variety of ways. There is increasing concern, for example, about the problems that may arise through deliberate deforestation of cities, lakes, rivers and local environments. As each of these situations may have some feedback on our weather and the climatic system of the planet,



"Chelmon rostratus", a fish that inhabits coral reefs in the tropical Indo-Pacific regions, a photograph from *The World Encyclopedia of Fishes* by Alwyn Wheeler (Macdonald, £19.95).

Exclusive club

Reflections on Gender and Science
by Evelyn Fox Keller
Yale University Press, £17.95
ISBN 0 300 03291 9

In recent years, many scholars have shown the extent to which western science, like all aspects of our society and culture, is permeated by the centrality of gender to human experience. The value of this insight becomes clear, however, only in sustained and detailed scholarly studies in which theoretical and empirical elements are deftly blended. *Reflections on Gender and Science*, by vouching superficially on many facets of this complex issue, fails to deliver the goods.

It is a collection of nine short essays, some of them previously published, arranged into three parts, each of which examines the relationships between science and gender from a distinct point of view. The first is historical and selects as case-studies three "moments" in the development of science. The second explores the psychodynamic underpinnings of scientific ideology, using an "object-relations" approach. The final section also consists of case-studies, this time drawn from 20th-century science, discussed from what the author calls a

"scientific/philosophical" perspective. Certain themes recur: the relationships between subject and object, masculine and feminine, science and nature, power and love. Throughout, Keller insists on the importance of language in general and metaphor in particular for an understanding of science and its psychological foundations. The thesis she advances is that modern western science is more "objectivist" than objective, in that it treats nature as a separate object to be known through domination – a relationship modelled on the masculine-feminine dichotomy. "Genuine objectivity", by contrast, would emerge from a "gender-free science" which embodied human, as distinct from specifically male, values.

Reflections on Gender and Science is an attempt to tackle some very large issues indeed, including scientific epistemology, the links between theory, practice and ideology in the natural sciences, the rhetoric of science, the psychological roots of power relations, and the historical development of western science. Not surprisingly, given the length of the book, none of these can be dealt with in any depth. For example, despite frequent references to the importance of scientific language, sustained linguistic and textual exegesis is nowhere to be found. This is partly because an extensive use of secondary sources gives the impression of a collection of second-hand, disembodied arguments. The reader gains no sense of how contradictory

and riddled with tensions language is. Furthermore, since she does not firmly locate scientific writings in a cultural context, we cannot gauge the extent to which science shared in or was distinctive from broader linguistic practices, and without this the language of science resists full interpretation.

The historical analysis is also inadequate, since an emphasis on "moments" tends to obscure the processes of which past and present are composed. The analogy implicit in the phrase, "the moment in which modern science was being born" is wholly inappropriate, because, even if the act of birth takes time, it is none the less a discrete event, defining the boundaries of which is not particularly troublesome. To locate the genesis of modern science, by contrast, is to undertake a massive task of historical interpretation, which would of necessity include a discussion of what we mean by "modern".

Many of the ideas canvassed by Keller are certainly suggestive. She is particularly to be praised for attempting to bring a psychoanalytic perspective to a field which has been notably innocent of such matters. And she is surely right to emphasize that working at such a level is crucial for an understanding of science. Yet it would seem that here, as elsewhere, she has picked out bits of theory which seem useful, without fully working through the arguments involved. Severed in this way from its rich source of clinical material, and from the diversity of interpretative responses to it, a psychoanalytic approach can all too easily seem naive and overgeneralized. Furthermore, there is a problem of intended audience here. Although it is written by someone who is committed to practising science, it is hard to know what working scientists would make of the book. I suspect they would find it difficult to respond to feminist theory, the book is not particularly satisfactory either, partly because it fails to draw on much of the most distinguished and rigorous work in such fields as political theory, anthropology, history and literature. Historians and philosophers of science will find the volume limited because it does not seriously engage with their work.

Finally, there is a central problem which Keller does not satisfactorily resolve. For her, western science manifests its characteristic "objectivism" because it is deeply "genderized", and "emotionally charged", continually coloured by "prior extrascientific commitments". What then would be the necessary conditions for the new "gender-free science" to emerge? Would it be possible for gender ever to cease to express differentiation in our social and natural worlds?

L. J. Jordanova

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HARVARD

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Social constructs

Geography Matters a reader
edited by Doreen Massey
and John Allen
Cambridge University Press,
£20.00 and £5.95
ISBN 0 521 26887 7 and 31708 8

As this book had its origins as one part of the Open University's course material on the subject of "Changing Britain: changing world: geographical perspectives" (the first questions to ask are whether it will be useful when viewed from its former context and whether its intended purposes to "evolve the critical understanding of students"). The compilers do not, however, outline the types of student they expect to benefit. The book reminds me a little of R. Palm and D. A. Lohmeyer's *Invitation to Geography* (McGraw-Hill, 1973) but the level is higher and the tone more serious: nothing about rock music or football teams here.

Massey and Allen have divided the material into four parts, each of which consists of an editorial introduction followed by two or three contributions

– mainly articles from journals or extracts from books. Others have acknowledged sources and so are presumably originals; one essay is adapted from the script of a television programme on the history of nature. The 10 contributions cover material ranging from the societal conception of space, and the urban economy, to considerations of feminist geography, labour migration in the Arab Middle East, the state of the nation state in Europe, and environmental futures. By no means are all the pieces written by geographers; the last-mentioned, for example, comes from Francis Sandbach's excellent *Environment, Ideology and Policy* (Blackwell, 1980). Whether at a local scale – as in the study of the de-industrialization of Lancaster – or globally – as in the article on the long arm of the United States in influencing trade embargoes – I have no doubt that each piece in its own way is interesting and stimulating. But as most of us would compile an entirely different set of readings, I don't quite see for whom this particular compilation is going to be useful outside the supporting content of the Open University's course.

One serious misgiving is that the editors assume that geography and human geography are the same thing, and that the natural world is merely and only a set of social constructs. This is neatly confirmed in Mick Gold's "A history of nature" which contains references to twentieth-century science at all, only to technology as an instrument of society. Now it may be acceptable to argue that the philosophical basis of postivist science is untenable and that nature does not exist outside our models of it, but it is surely not tenable to accept that the argument is settled. Beyond that, the editor's introductory critique of the recent history of human geography is excellent in its concise competence, although again I hensiveness will draw back from the thought some will draw back from the statement that "neither the social nor the natural" can be conceptualized in isolation from the other. My impression, too, is that they underestimate the depth to which ideological agendas and advocacy have penetrated what is no citation of David Harvey, for example.

In general, however, the editors aim to stimulate is likely to be successful. Whether they would by this volume convince any sceptic that Geography "matters" is less certain. So let it be put in front of the resources committee of the first year institution proposing to abolish its Geography department and see what happens.

I. G. Simmons

I. G. Simmons is professor of geography at the University of Durham.

FOUNDATIONS OF PROGRAMMING

A volume in the APIC Studies in Data Processing Series
Jacques Aracé
1985, 288pp., \$29.50/£23.00 (UK only). ISBN: 0-12-064460-6
This book will prove useful, interesting, and provoking not only to all practicing and aspiring programmers, but to those with an interest in programming techniques and methodology.

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This book offers an inside view rather than a user view of operating systems. It stresses practical and mechanical aspects, rather than principles and theory. It is addressed principally to those studying computer engineering but will be useful for anyone with an interest in how systems work.

ADVANCES IN COMPUTERS

Volume 24
Edited by Marshall C. Yovita
1985, c. 382pp., \$55.00/£35.00 (UK only). ISBN: 0-12-012124-7
CONTENTS: S. D. Conte, H. E. Dunmore, and V. Y. Shen, Software Effort Estimation and Productivity; M. A. Harrison, Theoretical Issues Concerning Protection in Operating Systems; S. Dasgupta and B. D. Shriver, Developments in Firmware Engineering; R. B. Banerji, The Logic of Learning: A Basis for Pattern Recognition and for Improvement of Performance; P. L. Garvin, The Current State of Data Processing; D. H. Kraft, Advances in Information Retrieval: Where is it? & Record? W. F. Atchison, The Development of Computer Science Education. Each chapter includes references. Author Index. Subject Index.

INTEGRATED TECHNOLOGY FOR PARALLEL IMAGE PROCESSING

Edited by S. Levialdi
1985, 266pp., \$39.50/£29.50 (UK only). ISBN: 0-12-444820-8
Image processing is an expanding field: robotic vision, remote sensing, biomedicine, astronomy, automatic navigation and exploration, all demand efficient, fast, and reliable computation. Papers from leading academic, government and commercial research centres illustrate the many different approaches being taken to solve problems in designing and integrating into chips organized collections of processors (of varying complexity). The book will prove both stimulating and invaluable as a reference source for all those working in this field.

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BOOKS

COMPUTER STUDIES

Natural algorithms

Biological Information Processing: current theory and computer simulation
by J. R. Sampson
Wiley, £37.00
ISBN 0 471 06281 2

The notion that technologists and biologists have much to offer one another goes back to the late 1940s. Then it was called cybernetics and the champion of the cause was Norbert Wiener. The idea that technologists could help life scientists to understand living things is as appealing as the converse, that life teaches technologists how to design better systems. But nearly half a century later only a few stalwarts would claim to be cyberneticists. And yet Jeffrey Sampson's book would have been hailed by Wiener as being in sympathy with the purest aims of cybernetics. Strangely, neither Wiener nor his ideas get a mention in Sampson's writings.

These ideas are undoubtedly stimulating, but the amount of progress that is in clear evidence on the basis of mixing technology and biology is not as voluminous as Wiener would have predicted. Sampson's book is certainly going to be influential in clarifying this interface. What is not clear is that it will stimulate new thinking on either side of the divide. His inspiration seems to come from the late David Marr, who in 1975 wrote: "The mysteries of development and the central nervous system will ultimately be explained in terms of processes, data structures, virtual machines, methods, algorithms."

Sampson begins by arguing both that information processing is ubiquitous in natural systems and that computer scientists, being concerned with the design of information processing systems, could get some new inspiration from the way nature does it. The problem with this sort of argument and possibly the reason for its lack of past effectiveness, is that

computers and biological systems process information in totally different ways. Computer scientists live in a world dominated by the "blank slate" digital computing machine - merely a vehicle for carrying out their masters' desires. Should the scientist wish to simulate a biological system, he can certainly do so. But should he wish to simulate the workings of a steam-driven snowplough, this too is no problem.

One might argue, therefore, that the understanding of a system must come a long way before a machine simulation can be approached. This is not a denial of the immense computational power of computers, in the sense that they can simulate highly complex mathematical models of "understanding". Indeed, the first part of the book is an excellent introduction to models of biological systems. In most of these instances, the importance of the computer lies in confirming the correctness of the model by demonstrating that its behaviour resembles that of the natural system. However, this should not be confused with the discovery of new facts, which is the result of the intellectual input of the scientist and not of the calculational powers of the machine.

Parts two and three, dealing with informational models of biological cell behaviour, are certainly instructive. I must question, however, whether the presentation, despite repeated use of the word "information", has much to offer over and above a good introductory text on the subject. For example, under the technological-sounding heading "genetic algorithms", Sampson writes, in the context of "parallel processing" in the replication of chromosomes: "Additional acceleration of eucaryotic replication is conferred by the division of the genetic material into several chromosomes which replicate independently."

This is an example of good biology, questionably dressed up as technology. The fourth and final part deals with that fascinating biological component: the neural net (a network of nerve cells diffusely distributed through tissues). Here, however, the author totally ignores one of the major controversies about the value of biological models to computer scientists which raged in the late 1960s and early 1970s. In their book on the computational effectiveness of neural models, Marvin Minsky and Seymour Papert skillfully argued that general, "blank slate", computation was much more productive than the computation offered by neural models. This set the scene for computer scientists to ignore biological sys-

tems as sources of good ideas for the design of information processors. Another gross omission in the last chapter of the book (on models of the visual system) is the total lack of reference to the models of the same David Marr who supposedly inspired the book. Marr's work at the Massachusetts Institute of Technology (MIT) was central to undoing some of the pessimism created by Minsky and Papert. His models of the human visual system have not only been accepted by the computing community, but are actually present in some industrial vision systems.

It is a pity, therefore, that this readable and well-presented book should have missed so many opportunities. The major of these is that there is a well-founded resurgence of interest in biological modelling in the computing community. Indeed, it is becoming clear that if computing of knotty problems is to be done fast, this needs to be done by massively parallel computing systems. Biological systems are precisely of this kind, leaving the computer scientist with a thirst for an understanding of how they work. Biological systems have natural emergent properties that are a function of their structure; and these properties seem to be at the centre of the ability of living organisms to access information rapidly, without those tedious, exhaustive searches that are the scourge of artificially intelligent programs.

Computer science departments at MIT, Carnegie Mellon University and several centres in Britain are beginning to study and gain an understanding of the emergent properties of such parallel systems not by simulation, but by construction. The silicon chip has changed the climate completely from that in which Minsky and Papert made their assessments; and some of their successors at MIT are now arguing that much of the future of intelligent computer systems lies in the lap of massively parallel systems that more or less mimic living organisms.

For those who wish to share in these exciting advances, Sampson's book may be recommended as background reading. For an up-to-date picture of the way in which biological information processing is being rediscovered, however, they will have to look further afield.

Igor Aleksander

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Basic hardware

Computer Architecture: a first course by Roy Dowling and Frank Woodhams
Van Nostrand Reinhold, £6.95
ISBN 0 442 30604 0

Intended as an introduction to computer hardware for students who have no previous knowledge of microelectronic circuits or computer system architecture, this textbook would be relevant for first-year students in electronics, computer science, and similar disciplines which require a knowledge of modern electronic circuits applied particularly to computer and microprocessor structures. It is not a text for undergraduate students who have reached more advanced levels in specialist courses. No hardware or software background knowledge is required.

At first sight, the title *Computer Architecture* might give a false impression, suggesting that the book concentrates on a functional approach to computing structures, data handling, and other high-level, "black-box" considerations. However, the text quite deliberately has a "bottom-up" hierarchical approach, dealing initially with individual devices, logic gates, and basic digital data methods before reaching any consideration of simple computer and microprocessor structures.

Chapter one provides a very basic introduction to the concept of binary digital signals, conventionally represented by 0 or 1; and this leads into logic gates and Boolean algebra. The active components from which logic gates are made - bipolar and field-effect transistors - are then briefly introduced, followed by a mention of

typical TTL and CMOS commercial logic families. However, although the treatment of this basic material is readable, it may cause problems if this is the student's only source of education. For example, it is implied that a transistor switched on and switched off may be identified with logic true (1) and logic false (0), respectively, which is not the way the subsequent logic circuits function. Equally, some students may not appreciate without prior information why there are 16 theoretically possible logic functions of two input variables. Canonical expansions, positive and negative logic and De Morgan's theorem might also have benefited from greater elaboration.

Chapter two, on combinational logic design, covers the principles of minimization and the use of Karnaugh maps, with the seven-segment decoder as a running example. Again, as the treatment is not in depth, some students may have queries not answered by the text. The chapter concludes with a consideration of multiplexers, programmable logic arrays (PLAs) and read-only memories (ROMs) for logic realization duties; again, more formal algebraic coverage, particularly with the multi-level realizations, might have been useful.

Chapter three, on sequential logic design, includes discussion of the use of PLAs and ROMs in the design of simple sequential networks, the two running examples being a simple traffic lights controller and a simple combination door lock. State minimization techniques are not covered, nor are the internal actions of the type D and JK clocked circuits introduced in the section on system designs. The chapter concludes with a useful introduction of state machines, buffers, and registers and memory cells for data bus structures.

Having completed this basic material, chapter four introduces the computer as a set of sequential and combinational elements which act on stored instructions - namely, the program. Simple block diagrams indicating

the central processing unit (CPU), the CPU bus structure, and the arithmetic logic unit are given; and this is followed by an account of how all the basic logic elements fit together. Chapter five continues the coverage of computer hardware by considering static and dynamic memory and examining how all the various components may be assembled to form a complete processing structure. The Intel 8085 processor is chosen as a working example.

The final chapter, entitled "Architectures and the designer", touches briefly on the software and programming aspects of the computer and microprocessor. Memory systems, direct memory access, networking and protocols are also mentioned, but the 22 pages available can only enable the author to introduce and skim very lightly over this subject-matter. A short bibliography and a useful glossary complete the text.

Whether the authors have succeeded in the very difficult problem of explaining the complexities of computer architectures is debatable. The parts never form a whole until experience has welded them together: this useful book introduces the parts; experience beyond this basic material should complete the whole.

S. L. Hurst

S. L. Hurst is a visiting fellow in electrical engineering at the University of Bath.

A third edition of Noel M. Morris's *Logic Circuits* has been published by McGraw-Hill at £6.95.

A collection of papers (with discussions) on *Mathematical Logic and Programming Languages*, originally published in the *Philosophical Transactions of the Royal Society*, has been edited by C. A. R. Hoare and J. C. Shepherdson and published by Prentice-Hall at £24.95.

BOOKS

COMPUTER STUDIES

Reliable programs

The Foundations of Program Verification
by Jacques Loecckx and Kurt Sieber
Wiley, £18.50
ISBN 0 471 90323 X

One of the most crucial concerns of software engineering is the development of programs that are truly reliable. Towards this end, various techniques may be used in establishing that a given program indeed performs as intended - testing, dataflow analysis, structured walkthrough, and so on. The most penetrating but technically difficult test involves program verification, a mathematical technique whereby a rigorous proof is provided which shows that a program conforms to some accurate and complete statement of specification of that program.

Different approaches to mathematical distinguished the applied mathematician and the pure mathematician or the mathematical logician. In most mathematics, it is acceptable to provide proofs that do not justify every single step by appealing to some basic set of axioms or rules of inference; rather, it is understood that should such a justification be necessary, then it can be provided. Mathematical foundations - comprising set theory, mathematical logic, and so on - is thus an important area of study, focusing attention on fundamental ways of reasoning to ensure that inconsistencies, paradoxes and illogical argument do not arise.

There is a parallel with program verification. Although both informal and formal approaches can be adopted, there is a need to establish a firm foundation on which all arguments can be based. At this level, the basic axioms that exist are related to the individual components of a programming language and derived from the definition of that language. The rules of inference or the means by which the axioms can be combined or utilized resemble those of mathematics. It is this fundamental aspect of program verification - namely, the logical foundations of the topic - that constitutes the basic thrust of this book.

Part one covers the mathematical preliminaries needed for the later work, including mathematical notation, set theory, induction and mathematical logic. Part two introduces



Queen Mary College's mark five computer-controlled experimental robot system, from *Computing Techniques for Robots*, edited by Igor Aleksander (Kogan Page, £18.50).

three idealized programming languages - a flowchart language, a while language and a language of recursive programs - the meaning of which is formally defined using a mathematical or denotational approach to semantics.

Part three - the major one, devoted to program verification methods - first provides a rigorous definition of correctness, essentially a measure of the consistency between a program and its specification. It is important to distinguish two different kinds of correctness: total correctness and partial correctness. Of these, total correctness is the more demanding, and programs possessing this property will both terminate and produce the expected outcome. A program that is partially correct, on the other hand, can never produce an unexpected outcome, although it may loop forever.

Topics covered in the remainder of part three include the classical methods of Floyd (which cover inductive assertions and well-founded sets), Hoare's axiomatic approach to correctness, fixpoint induction applied to recursive programs, and Milner's logic for computable functions. In all these cases, the authors investigate the soundness and completeness of the methods, emphasizing their relevance to total and partial correctness rather than their application in providing the correctness of specific programs.

A final short section, looking at the prospects for verification, discusses other approaches and other areas of work, including a brief look at automatic verification methods. All chapters possess accompanying exercises, and there are detailed bibliographies and

Useful Fortran

Effective Fortran 77

by Michael Metcalf
Clarendon Press: Oxford University Press, £9.95
ISBN 0 19 854710 7
Essentials of Fortran 77
by John Shelley
Wiley, £7.50
ISBN 0 471 90502 X

There are so many books on Fortran programming that one of the problems faced by the author of yet another one is what to call it. A couple of years ago it was essential to include the word "structured" in the title, but nowadays that seems to be taken for granted and the emphasis is on the usefulness of the language. These two books fall into this category. How well do they meet the objectives implied by their titles?

Effective Fortran 77 is an excellent example of a text aimed at those who have already learned to program in another language. The first two-thirds contain a concise description of Fortran 77 as specified by the defining standard, together with much useful comment on the desirability or otherwise of certain types of statement. I would take issue with the author, however, over the order in which he introduces some of these. His general approach is more that of a reference manual than that of a textbook, examples frequently being given of statement types which are not fully explained until several chapters later. For example, use is made of CHARACTER types in the description of "expressions and assignments", including some quite complex character manipulation, long before it has been explained in detail how a CHARACTER variable is specified. This "reference" approach also shows itself in the way in which the various control structures are described, in almost exactly the opposite order to that which would be used in normal teaching.

The real strength of this book, however, lies in the remaining third, in which the author gives us the benefit of his experience in writing real Fortran 77 programs in chapters concerned with such matters as program design and style, portability, efficiency, testing and documentation. These chapters are excellent both in content and style - and in my view, more than justify the cost of purchasing the book.

Overall, this is an excellent book for the experienced programmer who wishes to learn Fortran 77. It is not, however, a book for a beginner to programming, who will miss the presence of complete programs and any solutions to the few exercises and who will find the order of presentation in the first part rather confusing. In

fairness, however, the author states in his preface that it is not intended for this type of reader.

Essentials of Fortran 77, on the other hand, is intended for the beginner and is what the author claims to be the first example of a "circular text". By this he means that he has split each chapter into several "cycles", suggesting that the beginner starts by reading only those parts in "cycle one", and then returning to read "cycle two" when he has gained some experience, and so on. In this way, the author attempts to get round the well-known problem of ease of comprehension to the beginner versus ease of reference at a later stage. Although the concept has much to commend it (it is not, however, as original as the author believes), it does lead to some slightly awkward breaks in flow.

However, I do have some far more serious criticisms, the most important of which is that the language described is not Fortran 77. Chapter three, entitled "First acquaintance with Fortran 77", describes the structure of a Fortran statement in a way that bears little resemblance to the structure defined in the Fortran 77 standard. What is described is a modified structure suitable for a particular computer system - presumably a CDC Cyber 174, since the author states in his introduction that each program "has been executed on such a computer" "to ensure that it is correct" (sic). Also the author still seems to be thinking in terms of earlier Fortran practice and has not realized the implications of some of the changes which Fortran 77 has encouraged. As most of us have been using Fortran 77 for five or six years now, it is depressing to have a new textbook whose author has not updated his thinking to take account of the improvements made possible by the current version of the language.

Despite the fact that the book is well written in an easily readable and informal style, its technical faults mean that I cannot recommend it to anyone wishing to learn Fortran 77, whether as a beginner or as a convert from another language.

T. M. R. Ellis

T. M. R. Ellis is director of the Computing Teaching Centre at the University of Oxford.

MIT Press has published two new volumes in the Charles Babbage Institute reprint series for the history of computing. *The Preparation of Programs for an Electronic Digital Computer*, with special reference to the EDSAC and the use of a library of subroutines, by Maurice Wilkes, David J. Wheeler and Stanley Gill, has been edited with a new introduction by Martin Campbell-Kelly (price £33.50). *High-Speed Computing Devices* by the staff of Engineering Research Associates, has been edited with a new introduction by Arnold Cohen (price £42.50).

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BOOKS

COMPUTER STUDIES

Essential layer of software

Computer Operating Systems:
for micros, minis and mainframes
(second edition)
by David Barron
Chapman & Hall, £12.00 and £6.95
ISBN 0 412 15620 2 and 15630 X

An operating system is the essential layer of software that converts the "raw" inoperable computer system into an environment which can be used by the experienced programmer and naive computer user alike. Such a layer is required on all computer systems ranging in scale from the home personal computer to the large central mainframe; the length of the program suite which makes up the operating system can range from a few thousand lines of code in the former case to several million in the latter. Despite this range in size (and complexity), however, operating systems have

many features in common and are now built on reasonably well-understood principles.

David Barron's book is a rewritten, second edition of his earlier textbook which has been used widely as the basis for introductory courses in operating systems. However, the first edition is now thoroughly out-of-date, as it concentrated to a large degree on the so-called "batch operating systems" required by mainframe computers; it contained no information about personal computers or the interconnection of computer systems by networks. Furthermore, inevitably, it contained no information about the operating systems that are now widely used.

The second edition reflects this rapidly changing scene and draws extensive examples from contemporary systems, specifically CPM, UNIX, VAX/VMS and VME: there is a particular emphasis on the UNIX operating system, reflecting the rapidly growing importance of this system in both academic and commercial environments. Commendably, the book gives many examples from systems constructed in this country – when reading recent textbooks, it is all too easy to form the impression that all developments in computer science have taken place in the United States.

The new edition contains a chapter describing the historical development of operating systems (mainly as a way of describing informally some of the important technical ideas and establishing related terminology); a section giving an outline of the architecture (structure) of the operating system, including an introduction to the important idea of a process and its coordination

with other processes; a chapter describing how memory is allocated, including a detailed account of how UNIX and VMS manage memory; and a chapter describing how files (semi-permanent collections of data) are implemented in a number of operating systems. There is also a very interesting section on how terminals (visual display units, for example) are connected by software to an operating system (this is a surprisingly complex topic) and a short account of the networks. And the book ends with a very useful exposition of the "connection" between the user and the operating system, including the entries into an operating system that can be used by the programmer (so-called "system calls") and the command language available to the user, for both interactive and batch computing. As information on the user-interface is often omitted from textbooks in this area, Professor Barron's chapter on this subject will be particularly appreciated.

The book is written in David Barron's usual fluent, attractive style. Despite the informal approach, however, the book contains a lot of detailed technical information and will be well suited to an introductory course on operating systems or as a source of information for the more advanced computer user. I can warmly recommend it to teachers of courses in this area as a worthy successor to the first edition.

I. C. Wand

I. C. Wand is professor of computer science at the University of York.

Language link

Pascal for Fortran Programmers
by Ronald H. Perrott
and Donald C. S. Allison
Computer Science Press:
Blackwell Scientific, £16.50
ISBN 0 914894 09 9

Fortran was the first high-level programming language, designed over 30 years ago for use on the IBM computers of the day. It was highly successful, partly because of its sensible design and partly because of the fact that it emanated from IBM and received their full support. However, times change, particularly in the world of computers: today's most popular microcomputer will be regarded as old-fashioned in two years and obsolete in five.

Programming languages also advance with the times. Fortran was the first language to become more widely used, followed by Algol, PL/I and Pascal. Tomorrow's language, Ada, is already in use; and as the compilers become more readily available, it too will undoubtedly become more widely used. But the older languages, particularly Fortran, die hard.

Much investment has been made in suites of Fortran programs by many companies, including many libraries of routines. However, as these cannot be

rewritten overnight, unfortunately Fortran is going to be with us for some time. Recognizing that the understanding of Pascal is one step towards the understanding of Ada, Ronald Perrott and Donald Allison have attempted to provide a practical link between Fortran 77 and Pascal. All the features of Pascal are covered; and the material is well presented, examples being taken from Pascal programming constructs compared with the nearest equivalent in Fortran. The advantages and disadvantages of writing and constructing programs in Pascal rather than Fortran are clearly stated; indeed the chapter at the end of the book on "Pascal: comments and criticisms", illustrating the reverse side of the coin, would be a useful guide to an experienced programmer new to Pascal.

Chapters generally follow a set pattern: the description of a particular Pascal programming construct, together with a syntax diagram; whenever possible, the Fortran equivalent is also given, together with its syntax diagram. Carefully chosen examples are then provided for the two languages, clearly set out so that comparisons can easily be made. Many chapters also contain case-studies, and these are varied and well described. Each chapter ends with a summary, often with very accurate and telling comparisons of the efficiency of using the programming constructs in either Pascal or Fortran – revealing the authors' depth of experience of both languages. Further exercises are provided at the end of each chapter.

This very sound book is a serious

attempt to encourage Fortran programmers to learn Pascal. However, although Fortran programmers will be on familiar ground, it is doubtful whether such comparisons of programming constructs can provide a firm foundation for teaching a new language. Sometimes, there is a loss of elegance in the Pascal: the initial examples of repeat-until and while loops, for example, are contrived, so that they can be "translated" into a Fortran loop with a goto statement. However, a particularly good section explains how recursive calls are implemented; and a later chapter explains the concept of pointers, with examples such as 'linked-lists and binary trees. In a cautionary note on their use, the authors state that "the pointer type is often regarded as that 'gato' of data structures and that it can lead to programs that are difficult to debug". Indeed, some of the most convincing sections of the book are concerned with instances in which it is impossible to write a Fortran equivalent, with the authors concentrating totally on Pascal. Would it not be wisest to forget Fortran altogether?

Gillian Lovegrove

Gillian Lovegrove is lecturer in computer studies at the University of Southampton.

A second edition of S. J. Young's *An Introduction to ADA* has been published by Ellis Horwood (Wiley) at £12.50. The first edition was reviewed in *THES* on May 27, 1983.

Structured data

Data Structures and Algorithms
by Kurt Mehlhorn
Volume 1: sorting and searching
Springer, DM48.00
ISBN 3 540 13302 X
Volume 2: graph algorithms and NP-completeness
Springer, DM48.00
ISBN 3 540 13641 X
Volume 3: multi-dimensional searching and computational geometry
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ISBN 3 540 13642 8

The facility with which information can today be generated, stored, duplicated and presented places a burden of responsibility on both authors and publishers. Just as ease of use and ready availability of computers has spawned an uncontrollable rash of programming languages, expert in the exploitation of the arcane architectural features of their machines, and glib in their mastery of the baroque extra-

gances of their favourite assembly languages, so many writers have yielded to a variation of these hackers' passion to have something – meaning all too often, anything – up and running in the switching of a gate. This disorder manifests itself in a tendency to jargonitis, a seeming inability to distinguish between what is essential and what is of secondary importance and a lack of readily discernible structure in their completed work. These symptoms have parallels which are evident among the diseased in the programming fraternity: a lack of precision and clarity; a refusal to decide on a desirable overall structure before embarking on implementation; and an inexhaustible talent for swamping the function of their products in the minutiae of their realizations.

Reading *Data Structures and Algorithms* evokes unpleasant memories of attempts to divine the obscure purpose of a voluminous and frequently patched assembly language program. The text abounds in spelling errors, infelicities of phrasing and, more seriously, inconsistencies of notation and passages of impenetrable opacity. Faults in the first categories are forgivable in an author whose first language is not English and the blame for them must lie firmly with the publisher; but for

the others he cannot be so lightly exonerated.

A few examples of the more disturbing deficiencies are: a long discussion on random access machines followed by a deflating remark that they are of minor importance as far as the remainder of the book is concerned; the introduction of an Algol-like programming notation and its informal semantics followed, almost immediately, by an example algorithm which uses a construct which has not been mentioned; the confusing appearance of diagrams and discussion within the body of algorithms; the transposition of pages 34 and 35 of volume three; and the woeful inadequacy, for a text of such length, of a meagre index running to a mere five and a half pages. As the first of a series of monographs bearing the imprimatur of the European Association for Theoretical Computer Science, this drab and uninspiring production is a considerable disappointment. As for content, Professor Mehlhorn's massive text addresses one of the central aspects of computer science – namely, the design and implementation of efficient algorithms for the processing of approximately structured and economically represented data which denote the objects of interest in various problems.

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BOOKS

COMPUTER STUDIES

Learning frames

Introducing CAL: a practical guide to writing computer-assisted learning programs

by Keith Hudson
Chapman & Hall, £19.95 and £9.95
ISBN 0 412 26230 4 and 26240 1

It is a critical time for computer-assisted learning (CAL). Although using computers in the classroom has a 20-year history, it is only during the past decade that the advent of microcomputers and large-scale initiatives, such as the Microelectronics Education Programme (MEP), have enabled practising teachers to consider the technique in a serious fashion. Now, more powerful 16/32-bit microcomputers are having some impact on the educational scene, small networks of microcomputers are becoming commonplace, and the Computer Board and the University Grants Committee are funding research and development projects in the universities.

Clearly, a key component of CAL is the provision of educational software. Who is to create the material? How should it be designed? What are the means of funding? Materials must be

of high quality, and this seems to argue for specialized teams which could include teachers, designers and programmers. On the other hand, educational curricula and teaching methods are diverse, so that there must be opportunity for teachers to tune such software to their own requirements and to produce materials which might be modest in scope but which suit the needs of their particular classes. To realize these aims, teachers require software tools and guidelines for design. *Introducing CAL* has been written with this latter objective in mind, and its author gives several strictures on the uneven standards and value of present-day programs.

CAL is initially defined as a method of presenting educational material to a learner by means of computer programs which allow individual interaction. Thus, tutorial materials, simulation exercises and educational databases are included – and rightly so, for the varied nature of CAL is often overlooked. However, the author's interpretation then becomes more limited, as he sees CAL as a complete teaching system capable of taking the student from one skill level to another without help or intervention from the teacher. The curriculum and CAL programs are to be carefully structured in small steps, the individual student will respond actively and at his own pace, and the feedback should be immediate and accurate. In short, CAL is seen as a technological improvement on programmed instruction, but one which is based on the same views of learning.

Indeed, the author is anxious to show and defend such historical links. Thus, two chapters are given to the principles of structured learning and prompt reinforcement, and one to

their justification by considering physiological processes in the brain associated with reward-feedback, shaping and consolidation. However, although few would dispute the value of feedback, student activity and organization in learning, the author's views mean that he concentrates exclusively on the design of frame-based tutorial materials. There is no reference to cognitive psychology and no discussion of higher-level cognitive processes – or behaviour – such as problem-solving. Thus, the design of simulation programs, or learner-control systems, are not in evidence.

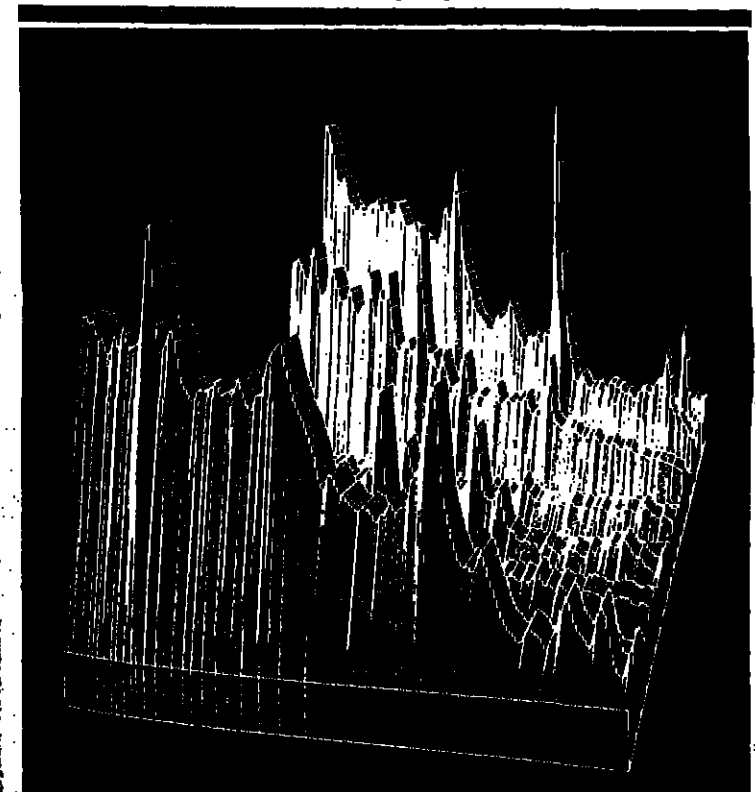
The main sections of the book are devoted to techniques of writing CAL units based on frames – ways of arranging and presenting types of educational content (for example, explanation, or feedback) on a visual display screen. A conclusion is made between introductory, test and link frames which inter-relate learning material; and CAL writers are advised to describe their programs by charts which show the sequence of these frames, the content they cover, and whether a response is required or reinforcement provided. Frames can be written in different formats (13 are listed) to control features such as presentation effects, cueing, and types of response. The design principles then become guidelines which relate sequence, frame-type and frame-format to the educational objectives and the type of subject-matter involved. All this is explained clearly and with illustration. However, techniques for analysing curricula and tasks (which cause the major problems in program designs) together with procedures for the validation and field testing of materials are covered in a mere seven pages, and are not well referenced.

As the book assumes that once the designs are specified in the frame sequences, a programmer can be used to deliver the materials on the microcomputer and provide adequate documentation, these program implementation topics are not covered. The guide ends by providing a patchy bibliography and a rather lengthy example of a CAL unit in biology.

In considering the design and production of CAL materials, this small book addresses an important topic. However, as the author reformulates the task to suit his own orientation to CAL, and his preferred (Skinnerian) view of learning, his book has an old-fashioned flavour. Although he points to the fast pace of technological developments, he utilizes an instructional methodology which was produced for much simpler teaching machines. Thus, the use of software tools such as database and modelling systems, and investigatory methods of learning using simulation techniques or software laboratories (for example, Logo), are barely referenced. Within its limits, however, the book is well produced. Readers who are content with the author's approach of program-directed teaching will find some useful illustrations.

J. R. Hartley

J. R. Hartley is director of the Computer-Based Learning Unit at the University of Leeds.



"Nuclear spectra", from Melvin L. Pridett's *Art and the Computer* (McGraw-Hill, £26.25).

continued from page 26

domains. I do not doubt the author's enormous erudition nor do I deny his prodigious industry, but his book betrays all too frequently its origins in the lecture theatre; and I must therefore question the wisdom of publishing it in its present form. Professor Mehlhorn might have been better advised to devote more time to sober reflection on his objectives and to indulge in some severe pruning, drastic reorganization, and patient polishing. He claims that the book "leads the reader to the forefront of research" and that it may be used as a textbook or for self-study. It is naive to believe, however, that all of the results of recent research will endure and it is prudent to delay until time has had an opportunity to winnow the wheat from the chaff before conferring the accolade of significance. Rather than rely on the text, I would advise research workers to return to the primary literature, undergraduates and in-service teachers, on the other hand, will quickly find themselves overwhelmed by a relentless avalanche of bewildering detail.

Yet within this seemingly bottomless morass of rigid, information-laden pages one can find a few pearls which may be profitably and laboriously mined. For example,

the author's commitment to providing correctness proofs and complexity analyses for all of the algorithms which he presents is estimable and could, with benefit, be made by other writers in this field. In addition, the second part of volume two and the whole of volume three deal with topics which have, in the main, received undeservedly scant attention in other books in this general area.

In volume two, the treatment of NP-completeness arises naturally from an investigation of the clique problem in graph theory, and this is followed by detailed discussions of numerous examples of practically important but equally difficult problems. Professor Mehlhorn emphasizes the power and usefulness of approximation techniques in generating acceptable solutions to intractable problems and displays many examples of their successful application.

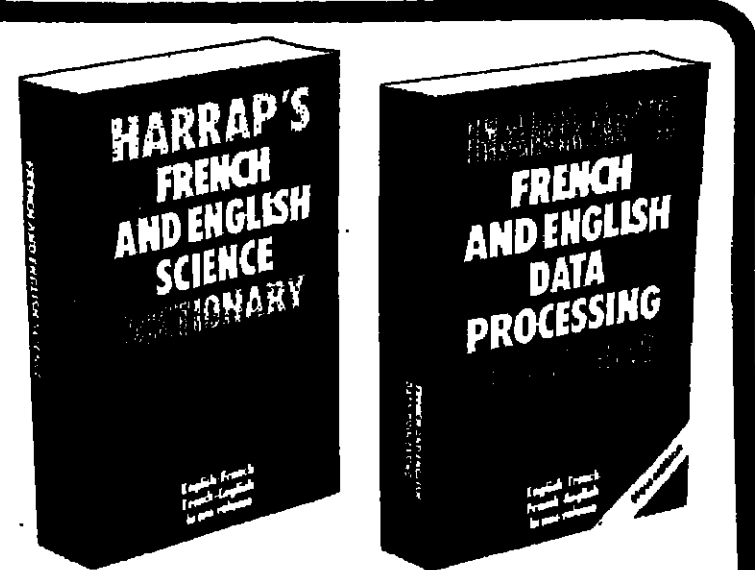
The material on which Professor Mehlhorn bases his discussion of algorithms for searching in multi-dimensional space – in the first part of volume three – should interest those wishing to learn about the formal bases which underpin the structure and re-configuration of database and information retrieval systems and the techniques used to gain access to these. The second part is concerned with a theme which is unjustly neglected in

many textbooks on algorithms – computational geometry. Here the generous treatment given to Voronoi diagrams and their application to important problems, such as the Euclidean travelling salesman problem, are worthy of further careful exploration. In addition, the discussions on the use of plane sweep techniques for problems in two-dimensional space and the use of geometric transformations, such as duality and inversion, to convert problems into others for the solution of which algorithms have already been discovered, also merit attention. As for volume one and the first part of volume two – on graph algorithms – the less said the better. There are already a number of superior rival texts covering these subjects.

Maurice Clint

Maurice Clint is senior lecturer in computer science at the Queen's University, Belfast.

A revised and updated collection of papers presented at the 1982 European Conference on Artificial Intelligence in Orsay, France, has been edited by L. Steels and J.A. Campbell and published as *Progress in Artificial Intelligence* by Ellis Horwood (Wiley) at £28.50.



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Expert Systems: concepts and examples
by J. L. Alty and M. J. Coombs
National Computing Centre Publications: Wiley, £10.00
ISBN 0 85012 399 2
Designing Intelligent Systems: an Introduction
by Igor Aleksander
Kogan Page, £12.95
ISBN 0 85038 860 0

An expert system can be loosely defined as a computing system embodying organized knowledge about some specialized topic which enables it to perform at around the level of a human consultant in that field. The first expert system - Dendral, a system for inferring the molecular structure of organic chemical compounds - goes back almost 20 years; and there are now systems in existence to perform a whole range of skilled tasks, such as diagnosing the cause of bacterial infections, assisting the evaluation of geological prospects, configuring VAX computers, and assisting in the design of genetics experiments. After years of neglect in Britain, expert systems and its parent field of artificial intelligence (AI) have become extremely fashionable, with an ever-increasing volume of work involving almost every significant academic institution and major company. The present state of the art is that building non-trivial systems requires a considerable knowledge both of the relevant theory from AI and of the design principles which have emerged from the growing number of practical systems that have been developed. At present, vast sorts of information have to be extracted from the literature, often with difficulty and

frequently from inaccessible unpublished reports. Although the number of books on expert systems has increased considerably in recent years, there are still very few that can be recommended. Most fall into two categories: collections of conference papers for the forefront researcher and oversimplified "do-it-yourself" guides for the beginner. Alty and Coombs's book is an attempt at providing the computing professional (or student in information technology) with a sufficiently detailed technical account "to enable him to conduct an intelligent appraisal of the relevance of the subject without being sidetracked by particular research issues". To this end, they have performed a remarkable condensation of information - covering in only 200 pages a vast collection of topics, many of which would justify a book in themselves.

Part one, on "background concepts" (approximately one-third of the text), provides a general introduction to AI via conventional computing techni-

ques and programming languages. The authors adopt a strongly logic-oriented approach, but they also consider production systems and uncertainty. The remainder of part one covers a wide variety of topics: first-order predicate logic, methods of formal inference and formal proof, and a large number of aspects of the problems of knowledge representation and search control, including semantic networks, frames, top-down and bottom-up reasoning, production rules, breadth-first and depth-first search, heuristic search and the combinatorial explosion. The Lisp programming language is also introduced.

Part two, on examples of expert systems, will for many readers be the more interesting one. An introduction to a classification scheme for expert systems is followed by a reasonably detailed description of eight major systems - Mycin and Prospector, Intersect and Casnet, Heuristic Dendral and Meta-Dendral, and R1 and Molgen. Although the reader with a particular

interest in any system will need to follow up the references to gain a full understanding, the glimpses given go well beyond the simple accounts in popular articles; and the efforts made to explain the important differences and similarities between the systems are particularly helpful.

The final chapter, "Further developments in expert systems", is probably the least satisfactory. It consists of a very compressed description of "resolution theorem proving" (dating from the mid-1960s) and the Prolog programming language (dating from the early 1970s) and seems to suggest (perhaps inadvertently) that a general and efficient solution to the problem of automating reasoning has now been found, and that this makes issues of representing and using large bodies of domain-specific knowledge obsolete. If this conclusion were true, most of this book would also be obsolete. However, the examples used in earlier chapters amply demonstrate the value of more sophisticated representations (frames, causal models, and so on) than simply statements in first-order logic.

What has been achieved in Prolog is a powerful logic-based programming language in which such higher-level representations can be implemented. Overall, this is a very interesting and useful addition to the literature. Although specialists will find many detailed points to criticize - indeed, no text of this length covering this amount

of ground can avoid over-simplification at times - for the intended reader this book may prove a revelation and a stimulus to more detailed further study. Igor Aleksander's book, based on a series of lectures delivered as part of a multi-disciplinary course to first-year undergraduates in electrical engineering, psychology and information systems management at Brunel University, provides a self-contained introduction to the design principles of AI systems based largely on automata theory and the theory of related algebraic systems such as "semi-groups". However, although this is an approach in which the author has personally specialized with much success, it remains very much a minority approach to development of the subject.

As such, this text would not be entirely suitable on its own as an introductory book for the general reader, but it would make a useful counterweight to the study of other texts taking more conventional views of the foundations of AI - for example, those adopting approaches based on predicate logic.

It is an interesting indication of the current state of the art that the reader who studies both these books will find little common ground between them.

Max Bramer

Max Bramer is head of computing science at Thames Polytechnic.

Storage elements

Digital Logic and Microprocessors
by Frederick J. Hill and Gerald R. Peterson
Wiley, £40.50
ISBN 0 471 08539 1

Introductory textbooks covering digital logic and microprocessors design are now a popular field for technical authors, reflecting the wide range of courses available in colleges and universities. The rapid evolution both of components and design methods presents continual opportunities for new textbooks, but at the same time brings rapid obsolescence to older titles. Within its 540 pages, this American text provides the basis for a detailed first-year undergraduate course. Most British authors, however, would have preferred a briefer presentation at a more reasonable price.

The book is subdivided into two major areas: digital logic (the first ten chapters) and microprocessor structure and systems design (chapters 11 to 16). The presentation of material on digital logic is quite conventional, beginning with a description of Boolean algebra and binary arithmetic and then introducing simple combinational logic design techniques. Standard small-scale integrated circuits are then presented to show how logic functions may be implemented physically. This also provides an opportunity to discuss practical interconnection problems such as loading, switching delays and noise immunity. The discussion of combinational circuits is completed by the introduction of a number of common, medium-scale integrated (MSI) components such as read-only memories and programmable logic arrays.

The final three chapters on digital logic introduce design techniques for sequential logic circuits. The structure of a basic storage element is first explained, leading into common MSI storage blocks, such as counters and registers, which make up the vital components of a computer. The introduction to sequential design methods which follows is based on algorithmic state machine charts and register transfer language - two formal description methods which provide a link to the subject of microprocessors.

Although the depth of coverage is generally good, and the material is supported by extensive problems and examples, there are some disappointing omissions. The coverage of logic circuit implementations is cursory; and dynamic logic, the dominant method of implementing microprocessors, is not mentioned. The section on sequential design, though rigorous, is not at all clear, nor does it show the range of alternative implementations which can follow from a single formal description. This is a pity, as much of the art of digital design lies in knowledge of, and correct choice between, a range of implementation techniques.

The second part of the book begins

with a chapter outlining the structure and organization of a microprocessor. Examples are based on a subset of the 6502 device, well known in this country because of its use in BBC and Apple microcomputers. Subsequent chapters consider addressing modes and assembly language, input/output methods, and microprocessor-based design. The strength of the presentation, undoubtedly lies in the extensive and useful range of assembly language examples, which should reinforce the student's understanding.

Again, however, there are some disappointing omissions. Although microprocessor-based design is covered by a design example, the design tools needed to implement the design are not mentioned. Similarly, the topic of high-level languages, their relationship with assembly language and the advantages and disadvantages of their use, are all ignored. Such an omission is serious, as now generally emphasize the merit of structured design and high-level language implementation - assembly language being viewed more and more as simply a vehicle for understanding the architecture of a microprocessor. This text competes with several other (mainly American) rivals. To guarantee success, it needed not only to provide complete and comprehensive coverage of the topic but also to preach a design philosophy which will remain valid in the foreseeable future. Sadly, it is flawed in both respects.

A. C. Downton

A. C. Downton is lecturer in the department of electronics and information engineering at the University of Southampton.

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BOOKS

COMPUTER STUDIES

Logical inferences

Introduction to Logic Programming
by Christopher Hogger
Academic Press, £35.50 and £15.00
ISBN 0 12 352090 8 and 352092 4
Logics for Artificial Intelligence
by Raymond Turner
Ellis Horwood, Wiley, £16.50
ISBN 0 85312 713 1

Logic is coming back into fashion. What in previous centuries was studied by clerics as one of the seven liberal arts is now routinely used in more modern forms by computer scientists for modelling, and reasoning about, complex systems. Logic is also the foundation of a new generation of computing machines, which use logical inference - instead of arithmetic calculation - as their principle of operation. A computation in this context is seen as a deductive proof generated from a set of axioms. Instead of writing a prescription of the solution to a problem, the programmer specifies a set of axioms - or general knowledge about the problem.

It has never been easy to recommend a comprehensive introduction to logic programming: the books available have been either textbooks for practical programming in Prolog, the first effective programming language to have been inspired by logic, or monographs on the theoretical foundations of the field. Important results

Formal constructs

Computer Science: a mathematical introduction
by Art Leis
Prentice-Hall, £14.95
ISBN 0 13 164252 9 and 164062 3

To many people, computing means, first and foremost, computer programming. Indeed, the usual introduction to the subject is via some relatively high-level language, such as Basic or Pascal. Programming skills are learned by familiarization with the fundamental constructs of the language, and these are applied to problems of increasing complexity. Having mastered the art of programming, attention is then turned to applications and the appreciation of hardware and software systems. As it is possible, and arguably desirable, to study many of these more advanced topics within a rigorous mathematical framework, Leis's book provides an introduction to the building blocks necessary to embark on a serious study of computer science with useful mathematical tools; or to acquaint mathematicians with an important application of their theoretical knowledge.

Much of the early part may be described as the study of discrete mathematics and includes chapters on sets and directed graphs. Broadly speaking, the book has been designed so that mathematical concepts introduced in an abstract manner in a "theory" chapter are then put to use in the next chapter on related applications in computer science. The two types of chapter, however, are not entirely divorced, as applications are used to illustrate the extension of mathematical ideas within the "theory" chapters. Moreover, some readers will observe, possibly with some disappointment, that many of the applications are themselves treated in a very formal manner.

Having introduced those mathematical tools which appear in many other similar books, Leis then diverts from the norm and includes a chapter on statistical concepts, with particular references to probability theory. By so doing, he is able to broaden the area of study considerably; expanding the domain of earlier applications (as well as introducing new ones). The chapter on optimization and dynamic programming extends the theory still further,

on implementation techniques and programming styles have rested in unpublished internal reports and in the proceedings of specialist conferences. The publication of *Introduction to Logic Programming* has changed all of this.

This book is a major contribution, partly because it provides a comprehensive introduction to all aspects of the field and partly because it is so well written. The first half of the book introduces logic programming at a tutorial level, but assumes some familiarity with programming. Though not intended to be a programming text - as the reader is expected to have overcome the difficult pedagogical issues in logic programming - the book does provide more background and foundation material than one might expect in a programming manual. Particularly useful is the discussion of various alternatives for control and data structures made available by logic.

The level of presentation is consistent with a first-year undergraduate computer science course. The introduction of new nomenclature and new syntactic notation for terms and programs, however, is justified in this instance, as the corpus of example programs provided is not large. And in any case, the presentation is not directed towards any particular real implementation of a logic programming language.

The second half of the book - collecting, simplifying and interpreting various topics from the technical literature - will be more appropriate to advanced students and new researchers. Two important aspects in particular are comprehensively covered: derivation of programs from logic specifications; and a survey of some techniques for implementing Prolog. Of considerable commercial value, this latter topic covers material so far found only in unpublished notes and obscure reports.

The revival of logic as a computational formalism is partly the responsibility of researchers in the field of

er, and the book concludes in a unifying manner by combining this probability and directed graphs, all related to the study of computer operating systems. In his preface, Leis indicates that the reader is expected to be reasonably conversant with a programming language containing conditional and loop constructs. The number of references to programming thereafter is in fact quite small: where code segments are used to illustrate particular points, the language may be Pascal, Fortran, PL/I, and so on; hence, the author has avoided linkage to a specific language or even machine. As well as a number of "pen-and-paper" exercises, each chapter contains several programming assignments, many of which ask the reader to code up algorithms described (sometimes very loosely) in the text and require considerable programming ability. Indeed, as the author remarks that "familiarity with the data structures used in operating systems is expected", it would be fair to say that the mathematician with little more than a passing knowledge of computing would find much of this book difficult to follow.

In contrast, the book would not require a solid background in the mathematical concepts covered, as in general these are introduced at an elementary level. Therefore, computer scientists with but a little mathematical knowledge should find much to stimulate and interest them. Although inevitably readers will at times become confused by the complexity of the notation, the material is well organized. A wide variety of topics is covered. And although the emphasis on breadth means that many of these are introduced at a superficial level, the numerous references to more comprehensive texts would make the reading of this book a good precursor to advanced study.

In view of the programming and associated expertise required of the reader, Leis's book cannot be regarded, despite its title - as an introductory text on computing. However, as it does provide a useful preliminary to the more formal aspects of computer science, I can recommend it to computer scientists possessing a modicum of mathematical ability who wish to obtain a deeper understanding of this sort of treatment of their subject.

Chris Phillips

Chris Phillips is lecturer in computer science at the University of Newcastle.

From Tokyo with love

Artificial Intelligence: concepts, techniques and applications
by Yoshiaki Shitai and Jun-ichi Tsujii
Wiley, £10.50
ISBN 0 471 90581 X

Artificial intelligence (AI) - often wrongly categorized as a branch of computing science - is a very recent and unusual feature of the intellectual landscape. Its path cuts at an angle across several well-established fields, including corners of philosophy, linguistics, psychology, mathematics and biology, as well as computer science. In the early days of the 1960s, the path was faint and rambling about, heading only vaguely in the direction of investigating, by computer simulation, the mechanisms of various aspects of intelligence. That path has become a minor road, still largely under construction but beginning to make noticeable progress towards its goals.

The promise is such that a number of commercial interests are now trying to run juggernauts along it, seeing it as a money-saving short cut to existing markets and as a viable route to new ones. In this country and elsewhere, AI has received a considerable boost from the establishment, and potential threat from the Japanese Fifth Generation Computer Systems Project, set up in 1982 by the Ministry of International Trade and Industry with impressive resources and organization. Proceeding with the analogy, that project represents a 10-year planning inquiry into whether the AI road can be upgraded to an eight-lane highway, with Japanese toolbooths at regular intervals.

The stated aim of this introductory book on AI, a translation from the Japanese original of 1982, is that it will "of assistance not only in research into artificial intelligence but also in enabling application of concepts... in various fields". However, as the book consists of only 177 pages, that laudable aim is unlikely to be fulfilled, as too much ground must now be covered if a reader is to appreciate the whole map of AI. But in its eight chapters, the book does touch on a good many of the most basic ideas; the representation of knowledge in forms suitable for manipulation by a computer; methods of searching through that knowledge to locate desired items; automated

reasoning and problem-solving; and features of the specialized computer languages used.

Some of these issues are tackled in appreciably more detail than is found in other introductory texts; others are merely sketched, the authors failing to mention the very serious cracks and potholes that will hinder the unwary. And as only a very few applications are mentioned, I doubt whether the level of detail would enable most readers to embark on practical rather than toy systems. The authors also reject the current fashion of fragmenting AI into components such as vision, language and speech processing, robotics, and theorem proving. These are mentioned, but only as instances of the basic techniques. A useful collection of references is given, although few are up to date.

The book's opening summary is endearing: "The symbols and formulae used are in accordance with previous practice in this field. For this reason there may be some discrepancies between the chapters regarding the symbols used in corresponding formulae... Unfortunately, this is true; for instance, the logical calculus symbols for "and" and "or" are described some 65 pages after they are first (and wrongly) used. Although AI has suffered from such flaws in the past, newcomers should now be able to expect a clear and consistent exposition of the basic ideas. Moreover, some established AI terminology seems to have been modified by translation to and then from Japanese; for example, the concept of "depth-first search" appears first under the heading of "vertical search", although the former is mentioned as a synonym almost immediately.

I am not clear about who the book's intended audience might be. Although it could serve as a vague mecum for an AI novice whose interest is in the practical side, he would need other material to be able to understand current technology and the underlying philosophy.

Peter Ross

Peter Ross is lecturer in artificial intelligence at the University of Edinburgh.

Springer has published second editions of the following titles: Niklaus Wirth's *Programming in Modula-2* at DM29.80; and Ellis Horowitz's *Fundamentals of Programming Languages* at DM79.00. The same publisher has also released a paperback edition of W. F. Clocksin and C. S. Mellish's *Programming in Prolog* at DM38.00; and a *Catalogue of Artificial Intelligence Tools*, edited by Alan Bundy, at DM49.00.

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